

DRAGON

USER

The independent Dragon magazine

60p \$1.20

June 1983

Joystick review

**Duck Shoot and
Millipede**

**Software
latest**

**Build a
game**

**Simpler
machine**

WIN
Premier
Microsystems
Delta disk
system

DRAGON USER



June 1983

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How to submit articles

The quality of the material we can publish in Dragon User isn't merely but is very much dependent on the quality of the articles that you can make with you. Dragon User. The Dragon 32 computer is based on the most powerful version of Basic, but with very good documentation.

Every one of us who uses a Dragon will be able to discover new ideas and to be able every day. To help other Dragon users keep up with the speed of the development each of us must realize that we make the necessary time — that means writing it down and sending it on to others.

Articles which are submitted to Dragon User for publication should be more than 2000 words long. All submissions should be typed. Please leave wide margins and a double space between each line. Programs should be submitted on plain white paper and be accompanied by a tape of the program.

We cannot guarantee to return every submitted article in program, so please keep a copy. If you want to have your program returned you must include a stamped addressed envelope.

We pay for articles according to the length and the quality — it is worth making that some do of it.

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Editorial

LESS THAN HALF WAY into the year another prediction of the home computer industry and Chinese developers alike are already being revealed as accurate — the year of the Dragon is fully upon us. Not only is the Dragon 32 eclipsing new markets in the case of the US, but new machines are being lined up to attack sales markets in the UK. And are offering users increased performance have already arrived.

But these data are only beginning to change the nature of the battle in question. Joyful prizes and Basic programs may be wondering where Dragon Data is going and whether they will be left behind — not exactly alone for there are more than 50,000 Dragon 32 users but maybe a little isolated. The answer from the company is an emphatic yes — and the same goes for our magazine.

However, Dragon Data's many new markets certainly present fresh challenges. It may be a claim to claim that the US market is highly competitive, but nonetheless it is a necessary observation. Alan Tress Instruments, Commodore and Tandy both its rivals. Colour Computers will not yield its title to any UK market. The business market in this country will be equally unyielding. In fact it can be argued that the year of the Dragon may not be as big a battle of it as one for the company.

Dragon Data has actually demonstrated that the end legs on the export drive have been worked out in less than a year to the third decimal place. When you're talking about US sales in the region of 250,000 these decimal points seem becoming very whole numbers.

But the selling prices of home computers can be very flexible. British cut this price on British machines at the end of last April. There are no prices for guessing what the totals at Microsoft announced not long ago — you've guessed, price cut. Similarly price reductions in the US last Christmas saw various manufacturers paying their own particular game of it for it. Obviously such activities can play havoc with those decimal point calculator ones.

In the UK business market the one machine or manufacturer has established a strong position. The number of users may appear to be growing but a machine as soundly developed as the Dragon 32 is for its market would threaten its life.

The cost of developing new machines for these markets and then promoting them is high — but not as high as the rewards. The first half of this year, for all its activity, may look more like a fall by the time 1983 has come to an end.

COMPUSENSE

Software for Dragon 32



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HI-RES

upgrade to a 32 by 32 display

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Just plug-in cartridge into your DRAGON, switch on and you have a 32 column by 32 line display with four lowercase characters. The existing software uses the high resolution mode to draw the characters on the screen and allow you to use BASIC (as in normal) or AG (there are a number of extensions to BASIC to allow you to use the newly additional features).

- Mix graphics and text on the same screen
- Speed any of the standard ASCII character sets by FRONCH, SPANISH, GERMAN, ITALIAN, BRITISH, USA, SWEDISH, DANISH or JAPANESE
- Rotate by any of the 34 characters
- WRITE GRAPHICS MODE enables any character to be on it by 8 bit fonts
- A new responsive keyboard with AUTO-REPEAT
- Extra lines gives the moving characters on the DRAGON keyboard
- Letters about 10,000 years for BASIC
- Switch between HI-RES and normal modes at any time
- BLACK or GREEN/BLACK on WHITE, GREEN or BLACK or WHITE on BLACK
- 32 by 16 compatibility mode for existing programs. There is a must for serious programming

DASM

easy-to-use 8008 machine code assembler cassette £18.00

- Specially designed for convenient use on the DRAGON
- Once set up a separate table
- Ideal for producing machine code routines to be called from BASIC
- Includes a 8008 Reference Card

Type your assembly program just as you would a BASIC program and use BASIC to call DASM. When DASM has assembled your program it returns to BASIC where you can check for errors and execute the program immediately if required. The source program is saved and loaded using the normal COMBIL/CLORD. The assembled program may be saved by tape using DRAVER (file can easily be done automatically in BASIC when the assembly has finished).

DASM is a new pass symbolic assembler which allows labels of any length (so it is five characters and the last characters are used). All the shift, movement and addressing modes are supported plus comprehensive assembler directives for defining constants, saving any memory, direct jump to source or pointer. Errors detected by DASM are reported with easy to understand text messages.

DEMON

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cassette £18.00

DEMON gives you access to the inside of your computer. It features a real time display of memory contents in both hexadecimal and alphanumeric codes, a full screen editor for memory and register contents and a full screen disassembler. There are twelve commands designed to assist in debugging and saving machine code programs in BASIC programs with PEEK and POKE. DEMON's entire reference protocols, features are disassembled and control codes which means that it does not interfere with BASIC. DEMON can be called from a BASIC program and will return control to the BASIC program. A user manual and a 8008 Reference Card are included.

DASM/DEMON

cassette £30.00

Combine DEMON and DASM in one cartridge. The ideal combination for developing machine code programs on the DRAGON.

DECODE

BASIC Converter

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DECODE converts BASIC programs between TANDY COLOR format and DRAGON 32 format. Simply CLORD the source program from tape. DECODE the cartridge and the program is converted. This same cartridge will work on a DRAGON 32 and a TANDY COLOR (Extended BASIC).

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Copyright routine

WHILE PLAYING around with my Dragon 32 I came up with the following useful routine which is able to put a copyright on all programs written by its authors.

Type
10 NEW
20 NEW

Then type
END (25512)

Then press ENTER (which starts up) is produced on the screen LIST your programs.

Then type directly
YOUR MESSAGE = 25512 (in the case COPYRIGHT MESSAGE SOFTWARE = 25512)

Then type
COPYRIGHT = 25400
SOFTWARE per YOUR MESSAGE ; and type ENTER twice

You will now see that the message in the case COPYRIGHT MESSAGE SOFTWARE is now at line 25512. This line cannot be edited or deleted and is hence a safe place to store your messages. You can now delete lines 10 and 20 and then type in your program.

*A. Stubbler
Campton
Wolverhampton*

Selected listing

UNTIL ASHLEY Davis I have been less than happy with the way the Dragon lists programs.

But I wonder if the fact related that it is possible to fit a selected program (LIST 200-400) does not fit and LIST 400 stops at 400.

One tip is to put just before a key change in a program one or two lines:

LIST *****

This can easily be spotted even when a lot of running through that is time to press BREAK and stop it.

One thing I find was editing a short and program to longer programs.

2000 STOP
2512 NEW
2525 LIST 2512-10

This should have given me a quick way of listing a program just by entering 2512NEW and

then the number of the section of the program I wished to list.
But, for example I cannot list the top products I can list some. Does anyone know why and if there is a way around the problem?

*Stanley Stewart
London W12*

Try the manual

I AM writing in reply to the letter from ASLEY Davis on the subject of the Dragon's listing facility.

To list a program using all that is necessary is to enter (25-2512) and to continue until you press any key. Do the list then read the (what appears) manual?

Finally a word of warning. Poking location 25400 with a screwdriver may damage your computer's health.

*Clyde Smith
Stratford
Redditch*

Twice unlucky?

AFTER THREE months use my Dragon 32 suddenly dumped an hour's typing and rather good commands, as given via CROM, is everything. I have no sign that it was immediately replaced by the driver.

However, the other evening I loaded a program only to find corrupts at a change. First came a sign which the machine was corrupt and the Dragon started printing every second line of program characters under the search I entered. I left in loaded and did no further work.

I remember having similar problems with one of the early computers that was totally caused by that getting at the

works. I could not understand what it was in the program or what you think that I have been struck by a program error?

By the way, how many other Dragon owners have found that they (found) a file and a file (found) (NEW 10 33) can be used to check for a program (found) moving up for the fact of a (found) command?

*D. L. George
Stonham by Sea
Dorset*

Bridging the gap

THERE MUST be a lot of many users who have mastered the simple programming technique and then want to know how the machine carried out the code we set.

I point to the fact that there is a vast gap, for example, between those people who know what PEEK and POKE are and do, and those who know what it takes to peek and when to peek them.

There seems to be no in-between-stage, only just tried.

I would like readers to consider the following programs which, although simple enough at first sight, raise many questions to be considered.

```
10 FOR I = 32768 TO 49151
20 AT = CHR$(PEEK(I))
30 PRINT I
40
40 FOR J = 1 TO 255 NEXT J
50 NEXT I
60 END
```

For examination of the additional information loaded and a memory map that programs print out the number of the memory that contains the data changed, for and it is very interesting to see the state change of memory. However, why is the last value?

at such word represented by a two-address program (what is it?)

Also, I notice these commands are mentioned in my literature that I have read. Finally, LIST, DLOAD and TAB with CHR\$(155). As the character only appears the once, I have the way of telling which value it represents.

What are the uses of these commands? I assume that what was the CHR\$(155) represents the TAB function will be the normal use? And why are they not listed in the instruction book?

I hope my point is clear and understanding these is not the same thing as understanding themselves.

*Anna Kent
Alderton
Norfolk*

Test the leads

IS ITLY to P. A. Love's way for help over the last occasion of programs from the Dragon (which the first set with me) for the second, but the computer mode but with the leads that can deal them.

In opening up the path along on the Dragon (which the first set with me) for the second, but the computer mode but with the leads that can deal them.

*Ray D. Cole
Merry Hill
Wolverhampton*

Dipswitch changes

I HAVE owned a Dragon 32 since last September and have found it a useful machine.

Recently I bought a Tektronix 6100A printer. After I had installed the two together I found that the LIST command (which was used in the Dragon manual) did not work as such. The same would be printed out. To solve this, the user had to be removed and dipswitch 3 had to be moved to the ON position.

Dipswitch 3 and 2 can be moved if you require it. I hope this information may be useful to anybody who cannot get the Tektronix printer working.

*Andrew Pennington
Wyke
Cornwall*

Software Top 10

- 1 Donkey Kong
- 2 Karateplus Attack
- 3 Pinball Invaders
- 4 Space War
- 5 Dragon Trek
- 6 Alcatraz II
- 7 Quail
- 8 Wizard War
- 9 Chess
- 10 Madness and the Minotaur

- Microdual
Microdual
Microdual
Microdual
Saleminder
Microdual
Dragon Data
Saleminder
Dragon Data
Dragon Data

Chart compiled by Boots

Dragon Dungeon

NUMBER ONE FOR THE DRAGON DRAGON OWNERS CLUB

The Dungeon is also the home of the largest Dragon Owners Club in the UK (or since members are scattered through Europe to Africa and the Middle East should we say 'the world'?)

The club magazine, *Dragon's Trench*, is published monthly and includes news, reviews, advice and information exchange for dedicated Dragon-bashers. Free members' adverts monthly offers (some members have already saved the cost of their subscription), competitions and for extrovert Dragonoids badges and bomber jackets.

Annual Membership: £6.00
(£8.00 overseas)
Six-month Trial Sub: £3.25
(£4.25 overseas)

DRAGONWARE CATALOGUE

The Dungeon stocks the widest range of Dragon 32 software in the UK.

Send for our 30 page Dragonware Catalogue (50p, refundable on first order) — free to club members.

Latest games: *Drift King* £18.00, *Caterpillar* £1.00, *Telling Andre's* £10.00, *Master Defender* (Tiger Software) £5.75, *Strategic Commander* £9.95, *Into the Labyrinth* £7.95, *King of Darkness* £10.95, *Geology* £10.00, *Arithmetic* £9.00, *Master Mind* £1.95, *The Valley* £11.00, *Planet* £8.50, *Star Jumper* £1.95, *Stacks* £7.95, *Night Pigeon* (Night simulator) £7.95, *Paper's*, *Game Pack* £7.95.

Latest books: *Dragon Encyclopedia* £3.50, *Making the Most of Your Dragon* £3.95, *Advanced BASIC for the Dragon* £3.95, *BASIC assembler for the Dragon* £8.95, *Demon Games for the Dragon* £2.45, *The Power of the Dragon* £4.95, *Know your Dragon* £1.95.

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Try your chances as an author

If you think you've discovered a winning game of software and you want to try to market it yourself, a company based in Hampshire may be able to help you.

Direct Media Facilities (DMF) has set up a copyrig-

service for authors and will design entry cards for the exhibitors. The company can also give some advice on marketing.

Mark Andrews, DMF's production-control manager, said: "We'll deal in it anyone who gives us a call."

To try and avoid any legal problems DMF is asking users of the service to sign a statement accepting responsibility for the copies produced.

DMF is based in Waterlooville in Hampshire — on 0707-41 60337.

Dragon Data goes on offensive

DRAGON DATA's expensive plans are going ahead with four new machines being lined up to enter the company's range.

Dragon 3D owners can upgrade to 64K in the second half of May by changing boards at a cost of £75.

The 64K board will give about 60K of RAM, the data going to Microsoft's Basic. However, Dragon Data will also be offering some languages on cassettes (Fort and Pascal) and Logo (giving users the L3 64K to play with).

For users wanting more memory the data drive system available at the same time will give 200K utilised in its

entry-level system costing £275.

The 64K board will also be used made the Dragon 64 which will cost £250-£300 and have other extras such as RS232C interfaces.

The next machine line will still be 6502 based, but with a more upmarket performance — raster interfaces, on-board graphics, plug-in expansion etc. This is due in September, costing under £400 followed by a business model next year.

By then the wheel will have turned more than 360° and Dragon Data is already considering a new machine to replace the 32.

Games arrive at the Midland Fair

THE MIDLAND Computer Fair held in Birmingham's Barclay Hall saw all kinds of new software for Dragon users.

The fair which was held over three days from April 26 had impressive displays from both Salamander and Microtel — the two main local orgs in independent Dragon software.

And other software houses traditionally associated with different machines have turned their attention to the Dragon — with both Quantum and

Personal Software Services offering new games.

Salamander had two new programs at the exhibition — Superstar, an arcade-style space chase game, and its extended graphics system.

Salamander also announced that it will be selling its products in Books — the retail chain — and in an interesting turnaround said that it will soon begin producing software for the Tandy Colour Computer. An initial order of Salamander software has already gone out to Books.

Strike the right note

IT IS now possible to get better quality and more variety in sound from your Dragon using a Sound Enhancement Module from JCB Microsystems.

You can experiment with Hammer and produce three

note chords with one Music command.

The module also gives game players a range of pre-programmed sound effects. These include machine guns, falling bombs and the more gentle sound of birds.

The £24.95 module plugs into the cartridge slot and has no extra wires or leads. JCB Microsystems is on 02033 423873.

Telesoftware lined up for summer

INTERFACES LINKING Dragons to a service known as Microtel 800 will be ready late this summer giving users tele phone access to a range of free and discounted programs.

Microtel 800 also offers electronic mail and message handling facilities, computer news and access to the more than 250,000 pages of information stored on the Prestel network system.

The basic hardware and software needed to link Dragons to Microtel 800 will be ready this September. They will be supplied as a network interface package costing about £50.

Other costs will cover subscription to Microtel 800 at £30 a year, and to Prestel at



Microtel 800 — Dragon interfaces are scheduled for late September

a cost of about £20 a year.

There is an additional charge for connections to the central computer between 5 am and 6 pm on weekdays and up to 1 pm on Saturdays. Obviously you also have to pay for the telephone link plus

special connected to the service.

In return, Dragon users will get access to two games and educational programs, which they can download over the telephone. The service's operators say that more than 100

such listings are available, constantly updated.

In addition you will be able to send messages to other Microtel 800 or Prestel users — straight from your keyboard. And messages for you will be held on an electronic mailbox.

These messages can only be accessed with your personal Microtel number which you receive with your interface package.

Microtel 800 was launched last March and aims to give up to 500,000 subscribers in its first three years of operation. Interfaced users available for 1983 might well differ, however.

The service is a joint project of British Telecom, Telemap, EDC Publications and Prism Microproducts.

ON 6/25/83

Disk market gets in gear

LOGIC'S WRITING for Dragon Data drive systems are going to have a wide range to choose from by the end of the summer.

In addition to Dragon Data's own models, drives will be available from Microprocessor Engineering (MEL) of South Britain and from the Speed Systems division.

Crayco's 1-based Premier Microcomputers already has two systems available with drive options.

MEL's entry-level system consists of one drive, a power supply unit, controller and an interface—for about \$235. The disk is the smallest of the microfloppies on the market: the 3-inch MCD-1 developed in Maryland.

But MEL's Stephen Polo pointed out that the step in the disk controller is capable of handling up to five data drives at any one time—3 1/4 or 5 inches. MEL therefore plans to



The MCD-1 single-sided floppy disk is just a postage controller cartridge.

add other cartridges to the range, called Jet Data.

Further, MEL's Joe Pomeroy warned about Dragon Data's data. As Polo says, if microcomputers wanted to use what manufacturers did not allow doing anything.

And Polo's remark added. The market is more than large enough for all of us.

Pomeroy's first two systems, Delta 1 and 2, come with a

controller cartridge, cable and 5 1/4-inch Gamma disk drive.

The entry-level system with a 40-track, single-sided disk, offering 160K of storage costs \$289.95. Delta 2 also has 16K storage.

Speeds of the other two is going to see what Dragon Data does before introducing its in-house systems. The first will be 5 1/4-inch models costing about \$275.

Modem on its way from Cotswold

A THREE-MAN firm in the Cotswolds is opening a wide world of communications to Dragon users by introducing two standard interfaces for the machine as well as a modem.

From June, Cotswold Computers will be selling H5000 interfaces linking Dragons to a range of peripherals such as disk drives and printers. This will cost about £30.

A modem also available this summer will allow Dragons to talk to each other over the phone so that small communications networks can be set up.

By the end of the year the firm will also be selling an RS232 interface extending the range of options for users even further.

Cotswold Computers can be reached on 05666 737492.

AT LAST! EFFECTIVE PROGRAMMING AIDS TO HELP YOU GET THE MOST FROM YOUR MICROCOMPUTER

PROGRAM DESIGN PAGE (100 Sheets A4 - 11 1/2" x 16 1/2")
The use of this system will enable development of a structured approach to programming, a concept pioneered by the BBC and other leading-edge bodies.

The sheets allow careful planned storage of each program for easy design and are so referenced with each other when longer, more complex programs are developed. They can be used as an invaluable debugging guide when checking any newly coded program, and will provide an invaluable tool for any programmer who has a store of computer listings on file.

GRAPHIC PLANNING PAGE (100 Sheets A4 - 11 1/2" x 16 1/2")

The large size does not affect the resolution or an enlarged high resolution are given with the great dimensions maintained on all four sides. In other words, no distortion of the image. The sheets are so referenced with each other when longer, more complex programs are developed. They can be used as an invaluable debugging guide when checking any newly coded program, and will provide an invaluable tool for any programmer who has a store of computer listings on file.

GRAPHIC PLANNING GUIDE (100 Sheets A4 - 11 1/2" x 16 1/2") Each grid is designed for use with specific microcomputers, and can be used as a guide to programmers working to develop the system. It is designed for use with the graphics of the system. Cards are marked on all four sides with a grid reference number, supplied with each computer for reference when they are used. (System: Dragon 32 and BBC A-1084 H 10, 1600 and 1600 and 1600).

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Table 1



unpredictable. Hill withdrew as highly successful game for the Oregon 30 — Donkey

This move follows a statement from Computer Games Plus, a subsidiary of the same entertainment group, which has announced its copyright on the title *Desktop Gold*.

International Patent Journal No. 2004/000000

extensively advertised in the computer press. Microsoft Managing director John Symes said "If they have made mistakes it has been enough: we are happy to learn."

Actually, if world leaders like Bush and Clinton are well going to replace a different Rome we will call it The East.

SOFTWARE HEAVE Peaksoft adapted its Champions football package to go sold the same as an important non-league game — and both the fans and the local team enjoyed it.

Their adapted version was
 Figure 4. Diagram illustrating
 that the social norm (Gut
 authors) would not be 3.0

Abstract

But the final score was 2-1. The package was also ready, right about the time of the winning goal which came in the 84th minute — just two minutes later than predicted. Two of Atlanta's best scorers were also named to the team.

Championships will be held for the Dragon and Pistol and can be collected on (2023) April.

ONE DRAGON just has opened an another closet as close to new members — Dragon Data has finally put its suit into operation while the

Users who have been watching all their Dragonquest cards arrive! As usual, should be now have received the first issue of *Dragon Quest* from them.

The journey that starts at home to apply for membership of the Dragon Users Club will appear in the new edition of the many leaflets

Subscription for the last year will be for the year commencing from the date of release of *Shogun*. Please rather than the date of selection (the seventh year).

The Oregonian Open is a 10-person club based in Lakewood. Its larger wishes to attract new members. The group organizer promises he will honor existing agreements, but does not want more pay-
ing the dues.

He puts this down to competition from other urban groups and commercially located Puerto clubs.



[†] **RESEARCH DATA:** All data are 100% management reported and collected by the AIAA/ASCE/ASME and sponsored full program. AIAA, ASME, and ASCE are 501(c)(3) not-for-profit organizations.

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Dungeon opens its cellar doors

The biggest Dragon users' club so far has its centre at Ashbourne — we went to talk to the Dungeon Master

INTRODUCING THE DUNGEON Master and featuring a total of 2,450, we bring you the Dragon Club of the Dungeon. Despite Peter Woods, the Dungeon Master in question, bring you the club — for he is the organiser of the largest Dragon users' club so far, with 26 new members joining every day.

Membership of the club costs £5.00 a year, or £3.50 for a six-month trial. Overseas rates are slightly higher (£5.00 and £3.50), but this has not stopped members joining from outside the UK — from Scandinavia, Germany, France, Spain and as its closest to the Arabian Gulf and Zambia. As Peter says, 'The Dragon has spread its scaly wings'.

UK members range from the Outer Orkneys in Scotland down to Jersey in the English Channel.

From fishing . . .

Peter is a former high flying marketing man who has come to rest at Ashbourne in Derbyshire. When he decided to end his corporate career he moved into the fishing tackle business with his partners. He had already come into contact with computers when his marketing work took him to

California's Silicon Valley. Compensating for his business's accounts increased his interest.

Peter explained that one of the problems with selling fishing tackle is that demand is seasonal, with a fall at the beginning of each year. Moving into the home computer business — with high post-Christmas sales of software and add-ons — seemed an ideal way of filling this fall and continuing business with pleasure.

The quality of the Dragon, and of the financial backing Dragon Data used to go independent last year, made Peter stand up — hence the Dragon Dungeon, the fishing branch of the business. But Peter is more than a businessman, he is an enthusiast — hence the Dragon Club. Now he develops nearly all his business for the Dragon while his partners look after the fishing tackle trade.

The Dragon Dungeon's business revolves around the Dragon — it sells a wide range of software and add-ons. The latest catalogue from the firm describes more than 80 games packages, in addition to educational and business programs, and more than 10 cables, including Astro man's Dragon Doodlers and Dances. Com-

puter's Decade cartridge and Dragon Port from Cass.

Peter emphasises that the Dragon Club is not a marketing ploy for the Dragon Dungeon. Members of the club receive a monthly newsletter called *Dragon's Teeth* in his Peter postbox. 'We'd like to keep the reviews and articles free from commercial bias. The Dungeon may indeed stock the program, but if you think it's faulty then say so. If you don't agree with the reviewer, then write in and say so.'

Peter wants members to take over the club and the magazine, with the Dungeon acting as a co-ordinating centre. Dragon's Dungeon is moving into new premises and Peter plans to leave one room free for reluctant members' suggest the club should be doing. As for him, 'We need to hear from you.' Luckily enough, the club room will be in the centre of the new building.

. . . to feedback

Peter is already getting feedback from members as *Dragon's Teeth* shows. The range of members' prearranging local questions and answers is sold if not surprising. The longer of the club is determined more by a longer-in-the-pole from one fairly recent. A request for help for a handicapped Dragon user, and a free advertisement for a writer user group looking for members.

A lot of Peter's attraction comes from listening and listening this spirit of camaraderie. But he does warn that the Dragon market is becoming big enough to attract fly-by-night businessmen — so beware.

And he also has some words of advice against copying programs. Most of the traps who write that software you expect to get it free for limited long hours over the keyboard. 'There is only a normally a rivalry on the number of tapes sold. I've want to have a steady supply of new ever-improving software we've got to look after the writer.'

But mostly the Dungeon is not a gloomy place. Members are already taking over the magazine, contributing reviews as well as tips and qualifying for a range of special offers, club badges and club T-shirts. If you're fishing, particularly as invent you can even enter a competition to be the world's best fisherman in a Dragon career.

Peter admits that he does expect his business to profit from the activities and regulation of the club, but in any event between his business ambitions and his enthusiasm for the club, neither is the case — explained it is his sleep that suffers. 'The Dungeon Master often gets less than five hours of rest a night. Maybe the delights in the dungeon is some kind of substitute for sleep.'

Peter can be contacted at the Dragon Dungeon, PO Box 4, Ashbourne, Derbyshire DE5 1AQ — or telephone (0333) 44635.



Peter Woods: whose Dungeon Club spreads from Scandinavia to Zambia



Alien go home

John Schoen tests his hand-eye co-ordination on some arcade-type action games — and finds some winners



THEY SWITCH UP recent software for the Dragon shows considerable variation both in content and in quality. Many new software houses are advertising each month and with such variety it is sometimes difficult to see the wood for the trees. Games can often be divided into two camps: old games that involve fast hand-eye co-ordination and team games that involve careful logical thought — although better games certainly involve both types of ability. This month I shall be looking at the first category which includes mainly arcade-type action games.

Also due from Gem Software, at £7.95 is a version of City Bomber. The game involves bombing a city of sky-scrapers until you have enough score to land your craft. At this stage, your fuel stocks are being depleted. When I tested this program, I felt rather dubious about such a dead end — it is, in fact, one of a difficult game to win and prizes have been published in magazines for some time now. This version is complete enough and employs good graphics and sound. It also gives you the chance to climb higher or lower on most versions you are forced to take down each time you cross the screen. It is a reasonable game to play for the first few times but soon becomes boring. Although you may get some fun out of this game, it is a little overrated for the type of game it is.

There are two versions of Missile Commander on offer: Missile Defender from Tiger Software and Defence from Microdeal.

Before the days of pretty picture arcade games like Dragon King, my favourite way of passing time was on Missile Commander. The arcade version puts you in charge of three bases protecting cities rolled across the bottom of the screen. As the game starts, six missiles fall from the top of the screen towards the cities. As they get lower, they split into baby rockets, which are just as deadly.

Your defence missiles are dropped by moving a cross on the display. Instead of popping, the arcade version uses the rather neat idea of controlling movement by a large ball that spins under your fingers. As each accidental missile is successfully destroyed, another laser wave engulfs and wave disappears, damaging smart bombs that home in on your cities with amazing accuracy.

Smooth ride

If you will do these two Dragon versions, approach the graphics and speed of the original. Missile Defender is a little on the slow side and the graphics are rather chunky. It had not been long since I would have said Missile Defender was far value for money at £5.75, however, if you can afford £5.60, then the Microdeal version is considerably more professional. The graphics are more detailed and at the program is written in machine code, the joystick feel smooths and moves responsive. As with many of its programs, Microdeal has obtained the license to sell an American game originally written for the

Fairly Color Computer. The title frame of the game shows that it comes from 'Colorful Software' and is well worth a look. £7.95.

These two examples also demonstrate an important point about program information. Missile Defender contains nothing on the cassette sleeve apart from the title and the name of the supplier. Defence contains a brief description of the game, but more importantly tells you what upgrades are required. If you regularly buy games, suit your for your Dragon, then it might be assumed that you have a pair of styluses, but it must be said that to arrive home with a new tape, only to discover that you have to spend the last part of £30 before you can play it. If only all software houses would supply this basic information.

Missile Run and Breakout are an opposite sides of the coin. — Arcade Action from Apex Trading. The games are very basic, and some children who played them compared them to old ZX81 software — not I feel, intended as a compliment. The cassette's of course only £2.95, which is not a bad deal. However, for a little more you could buy a really exciting tape.

Space Mission from Gemsoft starts off in an exciting manner. After the introduction, a space vehicle appears on the launch pad and there is a very nice piece of graphics as it lifts off and goes into orbit. This is when the game dead starts, and you realise, as cosmic rays come lumbering towards you that it is just another version of Asteroid. You can either play

ship to the left or right and lay it flat. After they are deployed, a wave of rain will attack you. This sequence is repeated until you are too badly damaged to continue. At this point, you return to the earth in a similar manner to the launch and you are given a grading according to how well you have performed.

The last two items I played this game. I was impressed by the introductory and finishing screens, but as they are not really part of the game, they become boring and it would be nice to jump straight into the action. The active part of the game is of a reasonable standard, but it is not difficult to discover strategies to ensure a good score and I feel that inside experts would find it lacking in real challenge.

Packaging

Although you certainly can't tell a book from its cover, in the realm of computer software it is usually true that nicely presented, attractive, containing good documentation shows the game amount of thought where it comes to the program itself. For me, a good box should contain instructions in the packaging as well as in the program. The latter should be optional leaving much time to prevent boredom, but there's nothing worse than trying to ascertain complicated instructions from the screen, only to discover that you've forgotten something vital to the beginning and have to run the program again.

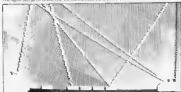
Software Software usually manages to produce interesting games, and its own sales are always neatly packaged in two video covers containing a game description as well as detailed instructions. Grand Prix is no exception to this, and the disappointment also reminds you of the by now fairly well known ROMs 65495 to speed up these programs.

The game starts with the opportunity to choose one of eight motor racing circuits from around the world including Indianapolis and Brands Hatch and you can select the number of laps you wish to race. Either one or two players are allowed and movement is controlled by the use of joystick. The fire button combines the functions of brake and accelerator when you are ready to begin the selected track appears in the cars shown as colored dots. At easy levels of difficulty there are few problems, but the higher you go, the more difficult it is to stop your car from colliding with other vehicles or from going off after passing over a patch of oil. When this happens, and for too frequently in my case, the screen flashes and as most cases the race is over for you. I cannot let game-enhancing end although not my favorite, it should appear to any budding champion with 27 to 31 in their pocket.

Master Mine, another game from Gem Software, demonstrates the improvement in speed that is achieved in a machine code program. The object is to get a little square from the bottom level of a mine to the surface while collecting as much gold as possible. The task is made more difficult if mine is laid impossible but I am



The higher you go, Grand Prix becomes difficult. It is no picnic, you see.



Chilly game is an Mine to Defenders from Tiger Software.

appeared it can be done) by miners who live along each level.

Some of you may like the facility to enter your name in arcade games, but be warned in Master Mine some useful personal messages are flashed on the screen as you fail for the umpteenth time! The ghosts in the last level are positioned at random along the passages, making the outlasting game that needs careful planning before you think you can beat the invaders from the safety of the bottom level. You are allowed the luxury of a saved level, but I can be used only once a game. There are original variations on Master Mine programs and is one of the best from Gem, well worth the £7.95.

With all the varieties of invaders and Space Wars on the market, it is a pleasure playing a game that shows a spark of originality, even if it has limitations. Such a game is *St George* and the *Dragon* from Computer Recalls. Although it may appear to be an adventure game, it actually involves steering the hapless saint across the screen, with evil beasts at your control. Such a task will often be difficult, especially as there are little things like slippery ladders, and last but not least, you go to improve your progress. I don't discover the impossibility of winning is a heavy bit of humor, and it was some time before I came close to reaching the desired result.

To keep you amused, there are musical interludes as you sink beneath the water or experience a piece of burnt toast. Instead

of a *kill* rating, at the end you get to see how far up the Saints league you reached. Although it is not the smoothest game ever written for the Dragon, it is worth the £5.95 to sit about in helpless laughter watching some poor chap make a waste mess of it then yourself garbage that is not a really thing to say.

Exceptions

Although it is often the case that computer games conform to a standard, some that the writers don't have the nerve to tell themselves there are exceptions. One of these is *Gameplay* 1 from B & H Software, containing four games: *Lunar Lander*, *Joseph*, *Blackjack*, and *Master Racing*.

Joseph is a trial machine program that uses large graphs to show the up and down. I don't really see the point of programs like this, as it is a fairly complex one, and involves no skill to play. The only advantage is that although you don't win anything, you also can't lose real money when you play. The game is the weak point on the cassette, and *Blackjack* is only marginally better, although the graphics are well conceived. When not wishing to encourage readers to lose their pocket money or house savings, it is better on the real thing. These gambling games do seem to have few realizations, and I always have a sneaking suspicion that the computer cheat!

I have left the other two programs on the cassette to last as they really are the



Be George and the Dragon. Phantoms are a heavy dose of action.

It often is in the pudding. Having resembles other versions in that players getted rewards from a hidden treasure, which from now on, the screen to the finishing post. There is all similarity only in the game you are permitted with a maze card giving full information on the previous performance of each level, except starting points are. All it is a much closer similarity to the real thing. There are options that allow you to put money on to ask to have an extra way bet or to make a bonus. Starting with a limited amount of capital the object is to make your last million in four days racing. Not content with a full game like that, the actual play uses a cool card system — no chunky steady Pull back like Scudler dogs!

A real test

The IBM game, Sultan's Maze is the best version I have seen for the Dragon, and although the computer price is rather high at £1500 it would be almost worth it to have a simulation alone. At the start, you are shown a general view of the surface of the maze. You have to successfully find their ships on small bases at a

subtle slow rate of descent. As you approach the surface, the screen display changes to a detailed view and the landing platform are clearly marked. Controls are available for left and right movement as well as negative thrust from the rockets.

If the game lasted less it would be exciting, but having completed your last mission the real test is yet to come. The task is now to save the ship through a fortress maze to pick up people from the surface without either crashing or running out of fuel. This is a challenging and well worth game, and well worth considering.

There are two versions of 3-D maze games in the selection. Sultan's Maze is supplied by Gern Software and Phantoms by Microdeal. Sultan's Maze gives the appearance of being an excellent game when it is first played. It is perhaps unfortunate that viewing Phantoms gives immediately afterwards to the act from the initial screen. Again it is a case of a machine code version showing up the competition at first.

In spite of the Sultan's Maze is still

worth considering. The scene is set at Hampton Court maze where the Sultan's bodyguard attempts to escape his robbed master. The maze is viewed from above at the start, which helps with your orientation of finding what you attempt to negotiate the maze while viewing it at 3-D from the inside. If you are prepared to sacrifice large amounts of energy you can look at the maze again or even climb through the hedge. There are several points lying on the paths, as well as picking these up you have to avoid running into the guard who appears in good or nasty guises as he looks out at you.

Phantoms by Gern Software is a similar game involving a maze and an alien's guardian. The maze resembles the time as phantoms are going out at you. There are difficult to destroy and even though you are equipped with lasers, the best way is to shoot him and run far away before a hedge when you can a phantom. The graphics are the most realistic I have seen in a Dragon, showing not only the layout of each location but the changing appearance as you can slowly reveal. You get subtle warning of the approach of the phantoms as well as a timing prompt to show you to get used to rushing round the maze. This is a two types of maze in which you can play the game, and it is one of the most realistic high speed games that I have seen in a computer. Making use as it does of the saved intelligence, potential of the Dragon.

US lead

It is clear that the American companies of the game have not waited their 10 month head start off in a strong programming skills, but it cannot be long before there are British games that are just as good. The extra time spent on testing or machine code is well worth it if it is the sort of result that can be expected. Although Dragon Basic is better than Sinclair's version it is not really good enough for high speed action games, and a result team that improve considering the type of game would do well to acquire Lance Leitch's excellent book, *Play* winning the title.

With this trend it is perhaps surprising that there are so few titles of games available for the Dragon. It is comparatively easy to blow a couple of £1000s with a good machine code program as Dragon Basic itself has demonstrated, saving the cartridge port on the Dragon is one of its most selling points. This would avoid the problems sometimes encountered with the cassette interface, although I am glad to say that none of these games gave much trouble in loading.

This concludes the selection of available type programs that are available with Phantoms and more games on the shelves at the High Street. It is good to see that originally not replaced. Friends at home seem to prefer the more chess games to the alien-busting variety and there are the games that rely on a combination of hand eye skills and logical thinking — perhaps a pointer for the way games should go in the future. ■

Software reviewed this month

Gern Software
Unit 1
The Maling
Sunderland
Herts

Alan Rice
Space Station
Morpeth, North
Sunderland
Tel 0785

Apex Trade Right Ltd
118 Grosvenor
Road, South
Preston
Lancashire

Amiga Software
£3.95

Tiger Software
62 Grosvenor St
Morpeth, North
Sunderland
Type 1 Year

Moss & Co
£3.95

Ballintra Software
17 North Rd
Brighton
E Sussex

Comet Plus
£1.95

W & H Software
208 King St
Cardiff
Wales

Comet Plus
£10.95

Microdeal
Dept. 100
41 Trow Rd
20 Acacia
Cornwall

Science
Phantoms Game
£10.95

Computer Fantasy
140 Antelope Rd
London
E1

St George and
the Dragon
£3.95

Personal Software Services

Presents

Fantasy, Heroes & Realities for DRAGON 32K



TEXTSTAR 12-95

TEXTSTAR ENABLES THE USER TO CONSTRUCT FILES IN ASCII FORMAT WHICH MAY BE RECORDED ON CASSETTE TAPE AND SUBSEQUENTLY RELOADED FOR TYPING, EXAMINATION, DELETING, ETC.

TEXTSTAR MAY BE USED EITHER AS A WORD PROCESSOR INCLUDING ALL THE USUAL FUNCTIONS OR TO EDIT BASIC PROGRAMS.

TEXTSTAR WILL HANDLE UP TO 200000 BYTES IN A .PRG PROGRAM OR 200 KBYTES FOR THE REMAINDER OF SIZES OR 64 TEXT FOR SAVING.

DRAGBUG 12-95

DRAGBUG IS ESSENTIALLY A MACHINE CODE MONITOR FOR THE DRAGON 32K COVER THE USER MAY MONITOR, ENTER AND BY USING HARD-TOUCH FOR MONITOR CONTROL (IF INCLUDED) ALL THE FUNCTIONS OF BASIC, TAPAL, PRINTING, POINTING ON LARGE MACHINES.



ATTACK 7-95

ATTACK IS A SUPER FAST, ALL MACHINES CODE ASSEMBLY WITH 2 KMS FOR HIGH SPEED RUN.

TESTING THE CODE SECURITY OFFERS ON THE PROGRAM PLANT, MONITORING WHILE ALL THE CAPTURED SPICE (BRAGGERS ARE STUPID), A HUMAN WAY OF BEATING WITH THEM CAN BE FOUND THERE, EACH ONE IS A MAJOR PROBLEM AND IT IS A RACE AGAINST TIME TO STOP THE BRAGGERS AND CARRY THEM BACK TO THE SECURITY DEPT. ROOMS. AFTER BEING ON THE GROUND FOR LONGS ONLY MATHS AND LOGICS MUCH FASTER OR HOW LONG YOU CAN KEEP THEM ALL LOCKED UP FOR.



DATAPLAN 12-95

DATAPLAN IS A DATABASE TYPE FILING SYSTEM WHICH ALLOWS THE USER TO A CORRELATE AND PRINT INFORMATION AS IT IS REQUIRED.

IT IS EXTREMELY EASY TO LEARN AND ITS STORING POINT.

DATAPLAN WILL STORE UP TO 200000 BYTES OF INFORMATION EACH OR 64 CHARACTERS ON THE STORAGE BACK OF 100 BYTES.

STARTRK 7-95

THIS VERSION OF THE POPULAR GAME OF STAR TRK PUTS YOU IN COMMAND OF THE USS ENTERPRISE DURING THE WAR WITH THE EVIL KLIKKING. YOU ARE TOLD THAT THE ENTERPRISE HAS BEEN ATTACKED AND IT IS YOUR MISSION TO DESTROY THE ENEMY. FEATURES INCLUDE: BATTLE SCENARIOS, LONG-DURATION BATTLE, DODGE, HARP DRIVE, REFUEL, ENGAGE, PHASER, PROTON TORPS AND ETC ETC.



Jockeying to be first in the joystick race

If your joysticks are worn out, or were never up to much in the first place, you now have a wide selection to choose from — Clive Gifford looks at the range

THE MOST POPULAR peripheral available for the Dragon must be the joystick. Dragon users who had hoped to do merely pieces of an action highlighted at the beginning, but some of the best arcade games need a joystick, and many utility programs benefit from control by a joystick which can be many feet away from the computer itself, in reaction to the limited

choice available last Christmas. Many companies, both large and small, have started producing their own joysticks for the Dragon.

There are two basic types of mechanism — switch and potentiometer. The switch type consists simply of four or eight switches aligned with the X, Y and the two diagonal axes. Moving the column in a

certain direction activates a certain switch. The value given is either an 'on' or 'off' and the type of operation can be coded to digital. The switch type, then, gives a less accurate value though it is usually more rugged, a good example of one being the Atari joystick. One variant of this type is the mercury switch joystick which works using a similar principle to a spirit level and is found on the Allen Le Glass.

The potentiometer type allows diagonal movement and is altogether more sensitive. It gives a variable value of both the X and Y axes and can be decoded as an analogue operation. On the Dragon with its extremely useful JOYSTICK command, it makes sense to use a potentiometer mechanism and in fact all eight of the joysticks reviewed use this system.

None of the eight can be described as semi-professional sticks, which are usually self-centring and are of a higher quality aimed at the serious games player. Most use a potentiometer system, but with some you can choose the stiffness of action that you require.

Easy action

The actual feel of a joystick is very subjective. I prefer an easy feel action while other people insist on a stiff joystick. But the sensitivity and accuracy of a joystick is an important and is much less subjective. To test the accuracy of the joysticks, I used several programs of my own — a stick-ping and a racing game. To test the quickness of response, I used Microdeal's Racer Ball, a Pacman-type game with a complicated maze that requires many changes of direction.

I had heard of problems encountered with joysticks not reaching the extreme corners of the screen and indeed the sheet of instructions supplied with the Flato Glass/Tandy ones discusses this in some detail. However, none of the joysticks failed to reach any of the corners.

The first joystick I looked at was the old-fashioned Dragon Data one. The old style joystick was a bulky affair in its unactivated state. It was poorly constructed though it had a solid stick movement and its OPA was fair value. The company has produced this type out and introduced a new, much more attractive style whose construction is very solid. Unfortunately the extra quality has put an extra £100 on the price (£219.00). This new style is a lot less bulky though it is still quite large, with the dimensions (excluding the actual stick) being 4 1/2 by 2 1/2 by 1 1/2 inches. The actual shaft was high (1 1/2 inches) and its movement was stiff. The fire button, square and situated on the top surface just behind the stick, has a nice clicking action. These were my favourite of the three types widely available through retail outlets.

The second pair I looked at were the Tandy/Flato Shocker joysticks which, at the same price as Dragon Data's, are in direct competition. The Tandy ones are difficult to hold, being almost square (3 by 2 1/2 by 1 1/2 inches in shape). I did not like the fire button on the front of the joystick. It is large and square shaped but with such a small pitch you hardly know when you have it.



Now and then companies have started producing Dragon joysticks

■ pressed it. The stick's action was not too stiff but the plastic covering on the shaft kept turning round as I gripped it. This was a little annoying and at a price of £19.95 they are not the best on the market.

Triplets

More than a third are the third and last part out of the batch is an widely available form. Its action came more than a marked similarity to Microtech's and Clares, suggesting that they are all produced by the same manufacturer. Interestingly these joysticks are being sold at different prices. The only visible distinguishing feature between the pairs is the screen used to secure the joystick housing.

These sticks are similar in shape to the new one from Dragon Data and Cascom (mentioned later). They have a small, round firing button just below the stick which is fairly short at just over 1 1/2 inches high. All three of the joysticks had the same stiff movement. They all worked well in the two tests though I found them rather slow on the arcade game test. The pair that came from Microtech however was obviously designed with the Australian market in mind. It featured a slightly different movement to any of the others, when I pushed the stick down the wire that I was controlling on the screen went up and vice versa! Thankfully the left and right movements worked correctly (but quite by accident just until what I used to be I'm sure) however that Microtech's other sticks are not like my pair. The drapes of the three sets were Clares at £19.95 with Microtech's £19.95 plus 50p postage and packing and Microtech's a retail price £19.95.

The cheapest joysticks come from Taton Electronics. These were also the smallest - just 2 1/4 by 2 1/4 inches and not lighted at 4 buttons. The joystick's mechanism are cased in the sort of box used in



arcade or shops for your own personal electronic projects with a metal top finished with enamel paint. I imagine that these sticks are home made but there is no crime in that and in the case I think the old phrase 'small is beautiful' applies. These joysticks are easy to use with an excellent spring resistance for the button on the front side. They are small enough to hold in your hand and offer good, fast control around the screen. Their only failing is that they are a little too easy to move and this could be seen on the joystick program. Though they are a little unsatisfactory they work very well and at £19.95 inclusive of post and packing they are excellent value.

The Dragon Dungen joystick is priced at £19.95 which puts them in the Dragon Data/Taton bracket. This joystick is unlike any of the others with a completely flat measuring just over 2 inches high. The fire button is just over 1 1/2 inches high. The joystick is used on the top surface of the stick and is the best of the batch reviewed. The action of the joystick is also good with only a tiny amount of pressure necessary to move the shaft into any position. The shaft end has a quality feel about it. My only major complaint is that the shaft only just over 1 inch high was a little on the short side. Perhaps I'm biased in favour of this joystick because I suffered my highest test score of 98.728 on River Rat compared to my previous

high of 97.235 using a few joysticks!

The last joystick reviewed are the Cascom ones. These sticks cost a total of £19.70 including postage and compare favourably with some of the more expensive ones. They have a very simple design to the ones from Microtech/Microtech Clares with the main difference being the longer shaft at 2 inches. The longest of all the joysticks reviewed and the much lighter feel which is somewhere between the old Microtech and the tiny Taton Electronics. The joystick itself was the shortest at 2 1/4 inches but has a still reasonable and not too easily negotiated. The last on this joystick was at a much heavier duty than that of the last. This stick had a nice balance between the ease of movement and the accuracy. Unfortunately it was a little slower in some circumstances but as a general joystick I control for better.

In conclusion all of these joysticks are well constructed, well finished and easy to use. The best way to decide for yourself is to try and ask a few different people. However if you are prepared to order your joysticks by mail I think you will get a better deal.

Favourites

My favourite pairs are definitely those from Cascom, Dragon Dungen and Taton Electronics. The Cascoms would make a good family joystick, while both the Taton and the Dragon Dungen ones are ideal for fast moving situations if you can get used to their little idiosyncrasies. If you prefer a stiffer action joystick then the Clares model at £19.95 must be considered.

It is a shame that no semi-professional joysticks are available as I would have been very interested to review them against the standard types. But I'm sure that the more expensive type of joystick will start to arrive in Britain soon. ■

Joysticks reviewed: from £15.00 to £19.95

Taton Electronics
104 Woodridge Road
Rushmore St Andrew
Ipswich
Suffolk
IP1 5PA
(0276) 28137

Microtech Computer Company
Pocklington House
Hilderley Road
Pocklington
Suffolk
IP24 1HN
(02076) 881151

Dragon Data
Available through retail outlets
such as Boots and
Woking Monopostoms
261 Roper Street
London SW1 8NS
(01 488 7871)

Clares
Farncombe House
252 Townside Road
Windsor
Oxfordshire
Reading RG4 1LW

Price: £19.95 a pair
including postage
Weight: 4oz

Price: £19.95 a pair
plus 50p p.p.h.
Weight: 5.1oz

Price: £19.95 a pair
plus previous model
at £14.95 a pair
if no longer
available
Weight: 5.1oz

Price: £19.95 a pair
including postage
Weight: 5.1oz

Microtech
41 Trow Road
B4 Audul
Dorset
DT1 2LJ
(02088) 61616
Also available from
good dealers such as
Crispstones
48 Junction Road
London NW1 6HD
01 859 9490

Cascom Computer Accessories
81 Dover Road
Barnet
MK20 8HT
(0294) 44712

Taton
Available through the
company's own retail
stores

Dragon Computers
PO Box 4
Richbourne
Cardiff
CF5 1AD
(02920) 44228

Price: £19.95 a pair
Weight: 5 oz

Price: £19.95 a pair
plus 50p p.p.h.
Weight: 5.1oz

Price: £19.95 a pair
plus 50p p.p.h.
Weight: 5.1oz

Price: £19.95 a pair
including postage
Weight: 5.1oz

Boots provides a firm footing for Dragon's future

Graham Cunningham talks to Anton Boyes of Boots the chemist, whose move into home computers has contributed to the Dragon's success

DID YOU buy your Dragon at Boots? The chances are that for one in three of you the answer will be yes because Boots estimates that about one third of Dragons sold so far have passed over its counter. The chances are that you will also be a happy Boots customer — because the company reckons that twice Dragons is returned as faulty than any other machine.

Even if you don't buy your machine at Boots it is a place worth checking for Dragon software and add-ons. For example the company expects to be the last place selling the new disk drive system from Dragon Data.

Boots staff is a happy customer of Dragon Data. In the words of Anton Boyes, who is responsible for organising Boots home computer sales: "It would be an understatement to say that we are tremendously pleased with the Dragon."

Boots move into home computers began with less than a dozen of its larger stores selling Vectros and Texas Instruments T100 in August last year; the number of stores rose to 50 and the Dragon made its debut appearing in Boots outlets that month. More than 150 stores covering every major city centre, stocks the Dragon now and the aim is to reach 200 before the turn of the Christmas trading year.

Boots first agent of the Dragon in pre-production form was in May last year. At the time Boots was looking at everybody who was in the mar-

ket with a view to expanding its home computer sales. When they saw the Dragon they were very impressed — if selected first.

According to Boyes, the Dragon beat off rivals because it was, effectively, a finished product, with a large memory and high quality graphics. The fact that the Dragon resembled a typical computer terminal with a proper keyboard keyboard also stood in its favour.

The BBC micro was not a proposition then because they were only starting serious thought into it and the new Spectra was ready at that time.

Central purchasing of home computers is handled by Boots, stationery and books. Birmingham department which also covers toys. An established relationship with toy manufacturer Mollie, Dragon Data's parent company until it went independent last November, also eased the way to acceptance.

Sales of the T100s were slow and the system was dropped

Since that August debut Boots microcomputer sales including the Dragon as its leading line have not looked back. The most recent estimates say that 50,000 Dragons were sold up to the end of this February. And Boots thinks that it accounts for one third of all Dragon sales. As Boyes says: "It is a

line with which we have associated ourselves."

But Boots has no objection to anybody else selling the Dragon. It achieved its starting supply position not by contract negotiations with Dragon Data but by the sale of the orders it placed for the machine.

The Dragon is only part of Boots' home computer drive. The last trade posted, un-

tilsh sales of the Vectro and even lower T100s were sold — not in hundreds but in dozens. The T1 system was finally dropped towards the end of last year. But the August move into 60 stores with the Dragon selling alongside the Vectro was a success.

Boots has expanded its range since then — it began to stock the ZX81 in the last up-



Boots move into selling home computers because of changing last customer



Jonny Boyes. It would be an understatement to say that he is completely obsessed with the Dragon.

Christmas and the Spectrum in February. At the top end of the home computer market, it also stocks the Commodore 64.

Last Christmas, the 1650 sold promptly and Boats would sell more if it could get hold of them. At Christmas time, 15 a game could also have been sold, but the company has no complaints about supplies.

We have had a very fair share of Dragons, Boyes said.

Boats has put as much effort into how it sells records as into which machines to stock. Each store's home computer section is very obviously a separate part with enough space for it to cater to experiment with all the machines in stock. The Dragon is set up with a Boats Thomson 14-inch monitor and a Ben 3150 cassette recorder in place of the two Boats models which is compatible with the Dragon.

Boyes added that sales staff have been given special training in this computer, ranging from going back to college to studying manuals. The training continues and is given a high priority. The sales staff on the spot to provide good advice that is not misleading.

Packaging in general often lets down the software

Also in stock is a range of software although Boyes commented, We thought Dragon software suppliers were a bit slow off the mark. The notable exception was Mordax's where Space War, Conway King and Planet Invasion have the lot of Dragon best sellers at Boats. Unlike packages for education and games are selling more slowly, but Boyes is not discouraged by this. They will make a market in the long term.

He is 'highly relieved' that the standard of packaging is going up. New presentation packs for Dragon Data is a software are ready — after Boats had spent some time pressing for an improvement. The packaging is general often lets down the software, he explained.

Boats is keen to increase the range of packages it stocks. A general user — the Boats Computer Club — in fact which is based in Nottingham — checks the quality of all the software before Boats will agree to stock it.

The company's hardware testing is also thorough. Out of every 1,500 machines it receives it must pass 80. Boyes commented that customers returned fewer Dragons as faulty than any other system. He thought the sales staff was surprisingly low for such a high technology product. When a customer is buying a machine, back a diagnostic cartridge supplied by Dragon Data is used on the spot to check the major functions.

All at the Dragons sold so far are still within their guarantee periods. Boats is setting up a system of service agents to provide support when the guarantee staff is sparse.

The good relationship with Dragon Data is set to continue despite the fact that Boats still has to ask the major manufacturers about selling their products. At the moment the company has requests to stock the Lyrix, a major local concern is that the Dragon remains the 'home user's' choice of machine.

In late 1983 models from Dragon Data hold their appeal to Boats. As Boyes said, We would look very favourably at stocking any Dragon machine which falls within our market — the home user. From the possibility of selling a bigger business machine cannot be ruled out in the long term.

Selling a business machine cannot be ruled out

Demand for the present Dragon is set high. Partly this is due to a backlog built up over Christmas, but Boyes also puts it down to the idea of home computers taking a share generally in the UK. A national advertising campaign this spring is expected to boost demand for home computers even further.

The Dragon 30 is to get a boost next spring. Boats will be selling the 484 upgrade along with the Dragon Data data system as soon as it is available. The store will also adopt C215 replacing the current Boats also plans to start selling the Spectra port an computer with the Dragon for about £350 including the connecting cable.

So new products will not surprise Boats' reaction to the Dragon. As Boyes said, We feel very close to this product. For research tests they set — he has a Dragon at home for prototyping, programming and sometimes testing software. ■





Your chance to program and repel the aliens

Save the earth from the alien invaders with **Andrew Black's** Dragon version of *Missile Command*

DEFEND EARTH'S FOUR remaining cities from the invasion of the alien invaders. Using this variation of *Missile Command*, destroy the invaders with your laser — which you move with a joystick (right) and the laser fire space bar. If the is defeated, place the joystick on a flat surface and move with one hand and fire with the other.

Instructions

1. Maximum number of missiles — this is the number of missiles to be fired before the game ends.

2. Skill levels — there are two types of difficulty.

Levels 1-3 — one missile at a time.

Levels 4-6 — two missiles.

Levels 7-8 — three missiles.

Levels 1-4 and 7 — you only have to be three spaces away to destroy a missile.

Levels 2-5 and 6 — two spaces.

Levels 3-6 and 8 — one space.

3. Angle — this is the maximum move that a missile can make in a turn (left or right).

4. Moving — use the joystick for the

arrow keys — as explained below.

Program notes

0-150

25

150-250

250-350

350-450

450-550

550

550-650

650-750

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750-850

850-950

950-1050

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1150-1250

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1850-1950

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2050-2150

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22350-22450

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22650-22750

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22950-23050

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23450-23550

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```
370 RETURN
380 FOR Z = 1 TO M
390 W = RND(2)
400 MX(Z) = MX(Z) + B * (W = 1) + B * (W = 2)
410 MY(Z) = MY(Z) + 1
420 MX(Z) = MX(Z) + B * (MY(Z) > 250) - B *
(MX(Z) < 0)
430 IF P*P*INT(MX(Z) * MY(Z) / 4) THEN 460
440 IF MY(Z) = 195 THEN MX(Z) = RND(250)
450 MY(Z) = 0: N = N + 1
460 IF N = NM THEN 500
470 PSET (MX(Z), MY(Z))
480 NEXT
490 RETURN
500 IF MX(Z) < 21 THEN C = C + 1: C(1) = 0: P =
10: GOSUB 510: GOTO 170
510 IF MX(Z) < 75 THEN C = C + 1: C(2) = 0: P =
84: GOSUB 510: GOTO 170
520 IF MX(Z) < 120 THEN P = 120: GOSUB 510:
GOTO 530
530 IF MY(Z) < 200 THEN C = C + 1: C(3) = 0: P =
192: GOSUB 510: GOTO 170
540 C = C + 1: C(4) = 0: P = 245: GOSUB 510:
GOTO 170
550 FOR D = 1 TO 300 STEP 3
560 CIRCLE (P(1), D) 4
570 NEXT
580 PCLS 2: RETURN
590 CIRCLE (X(Y) 3) 3: RETURN
600 LINE (120-170) - (X(Y) PSET
610 FOR Z = 1 TO M
620 IF X > = MX(Z) - A AND X < = MX(Z) + A
THEN 630
630 NEXT
```

```
600 LINE -(120-170) PSET: RETURN
610 IF Y > = MY(Z) + A AND Y < = MY(Z) - A
THEN SOUND 100 1: MX(Z) = RND(250)
MY(Z) = 0
620 N = N + 1: IF N < NM THEN 500
630 PLAY
TWO104GL3006CDDPFC00PDE00H0L3C
640 CLS
650 PRINT G 200: "YOUR SCORE" 8
660 IF S > HS THEN HS = S
670 PRINT @ 300: "HIGH SCORE" HS
680 PRINT @ 350: "DO YOU WANT ANOTHER GO
(Y/N)?
690 SCREEN 0 1
700 RS = PKEY: IF RS = " THEN 730
710 IF RS = "Y" THEN 5
720 IF RS = "N" THEN END ELSE 700
730 CIRCLE (X(Y) 2) 2: RETURN
```


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Learning to Use the Oregon 32 assumes absolutely no knowledge about computers and the reader is shown even the most fundamental operations such as "switching on" and loading a program. The book leads the reader through simple programming and then on to graphics, with several programs which show how to achieve tasks and even animation.

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The book contains a number of specially written programs which show the full potential of the machine.

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Keywords: *work engagement; organizational commitment; turnover intentions*

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Delights of the open road

As a teaser to their new book *Dragon Games Master*, Keith and Steven Brain explain how to construct a simple game which will test your skills as a player

DRIVING DOWN A winding road, dodging obstacles in a race against time — the may sound complicated but it can be done in a program of less than 40 lines. And once you understand how to produce a scrolling screen display you can incorporate it into your own programs to make them more exciting.

First we must sort out what different sections we will have to include in the program and in what order we need to deal with them. The following are the major items to be considered in the development of the program in a separate order of priority:

- 1) Draw the road
- 2) Place random obstacles
- 3) Put your car on the road
- 4) Take control
- 5) Test for collisions
- 6) Display time and distance
- 7) Create a way of winning the game
- 8) Make the program user friendly

The first question to consider is how to display a simple strip of black lines across the screen. It is equally easy to print as we could simply print the word black graphed lines (CHR\$(20) for ten lines).

```
10 PRINT CHR$(20) + CHR$(130);
   CHR$(130) + CHR$(130) + CHR$(130);
   CHR$(130) + CHR$(130) + CHR$(130);
   CHR$(130) + CHR$(130)
```

On the other hand if you think a moment you will realise that instead of having to type out CHR\$(130) ten times you can use the STR\$(0) function. This effectively is a string of specified length filled with one particular character. The six parentheses is not put out by delaying the next step as AS=STR\$(0\$(10 130)) and then printing AS whenever you want to show the

```
20 AS=STR$(0$(10 130))
30 PRINT AS
```

If we now add a return line and TAB we will get a straight black road which starts at the top left of the screen and runs down the left hand side until it reaches the bottom where the text will be automatically moved so that the printing of the road continues.

```
120 GOTO 20
```

Although this works, only black road marks are not quite like that so what about moving the road to the centre of the screen so it isn't? This can easily be achieved using the PRINT TAB command to move the car position to a specified column on the screen.

```
30 PRINT TAB(10) AS
```

The road is now printed down the centre

of the screen but it is still a straight and very unexciting. So the next step is to make the road wind about. Let's set the start point position (A) at column ten and then produce a new random variable B which is added to A to produce the print position. B is produced by RND(3) - 2 which will return -1 (B=1) 0 (B=0) or 1 (B=2). Then leaving the road to run straight, or making it deviate one column to the left or right after each calculation.

```
10 A=10
20 B=RND(3)-2 A=A+B
```

Wandering

You will see that the road now winds about on the screen but beware if you leave it wandering enough you might see PC ERROR (bowed the keypad) if the TAB position becomes negative. On the road will wrap around onto the next line if it moves too far to the right, causing a bit confusion.

Clearly some limits need to be set to the TAB position and this can be done by checking A. We will set the left limit at 1 and the right limit at 20 (to leave enough room to the right of it's to print the whole width of the road section without wrap around).

```
40 IF A<0 THEN A=0
50 IF A>20 THEN A=1
```

We now need to place our obstacles on the road — as yellow ones should be rare and easy to see, we'll use CHR\$(150). Variable C will be a number from 0 to 31, unique and the obstacles will be placed by PRINT C. Make sure that you remember to include that semicolon after CHR\$(150) on the road to the right of the obstacle will revert to green. It is essential to include the second PRINT as statement in the line as this moves the print position down to the bottom right-hand corner of the screen so that the screen prints below a state to print the next section of road.

```
110 C=RND(32)-1 PRINT = (C+480)
   CHR$(150); PRINT = 01
```

One thing that you will soon notice is that the obstacles are not always printed on the road itself, but may appear any where on the screen. This is because C can be any number from 0 to 31 and therefore they can be printed on any column right across the screen.

This can be easily rectified if we make a new variable D (a random number from 0 to 11) and then add this to A which is the variable which already determines how to

place the screen the road is placed. It gives C instead. The limits for C can now form A to A+12 which must fall on the road.

```
110 D=RND(11)+1 C=D+A PRINT =
   (A+D-C) CHR$(150); PRINT =
   01
```

The final stage is to put your car on the road! It is positioned into the car at 01 of the screen by delaying a new variable E (initial value 15) adding this to 204 to print position near the centre of the screen, and then PRINTing an inverse D at that position to represent the car.

```
10 A=10 E=15
110 D=RND(11)+1 C=D+A PRINT =
   (A+D-C) CHR$(150); PRINT =
   (204+E) " " PRINT = 01
```

You will notice that the car moves a lot faster if it so happens. To be able to stop the car when other moves are needed to remember the old value of E (the last position of the car) as the new variable L (then just a blank space in the equivalent position on the line above — they will cover the old car as the screen scrolls. Note that it is on the line above the current car position that the car must be checked out because the car actually starts left where it is positioned by PRINT = while the road moves as the screen scrolls.

```
10 A=10 E=15 LP=15
110 D=RND(11) L C=D+A PRINT =
   (A+D-C) CHR$(150); PRINT =
   (100-L) CHR$(150); PRINT =
   (204+E) " " PRINT = 011
   LP=E
```

You should now have a winding black road with yellow obstacles on it and a car which is sometimes on the road but which more often than not is off. The final stage is to put the car under your control with the cursor keys.

It would be perfectly correct to use a series of IF-THEN checks for INKEY\$ but a simpler and quicker way is to use the logical check in the line below.

```
70 IN=INKEY$ IF IN= " " THEN 100 E
   L=E+IN-E-1
   E=L
```

Breakdown

The last is a series to understand if it is divided into parts for explanation.

```
50 IN=INKEY$ (Read INKEY$ via RS)
IF IN= " " THEN 100
(If key just pressed jump on)
ELSE IF =ASC(0)
(If key was pressed then set variable F to the ASC(1) value of that key)
F=E+(IN-E)-(F-E)
(Increase (+) or decrease (-) the position of the car relative to the left side of the screen (E) according to whether the key entered (F-E) or the right or left (F-E) was pressed. This will be because (F-E) and (F-E) will return either 1 (left) and a 1 or FALSE and a 0.

```

Left and right are not the only directions in which we can control movement. A simple way to provide a two speed game box is to take advantage of the ability of the Dragon (CPU) to operate at 0.5 Mhz or 1.5 Mhz. The higher speed is obtained by POKE &HFFD 0 and the lower speed by POKE &HFFD 0 0.

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Let Topsy take the strain from machine coding

Pam D'Arcy introduces Topsy, which promises an easier method of entering machine code

FOR THE SERVICE machine code programmer is daunting enough without the tedious business of converting hex values to decimal or entering hundreds of basic data statements. It's *Topsy*.

This program allows you to enter the code as strings of hex and to address it flexibly or formally, leaving 12K for the actual program. Once loaded, the code can be both saved and run using simple action codes.

The program came about by my wanting an easier method of entering machine code than having to convert hex values to decimal or having to process every byte with *DATA* for Basic *DATA* statements. However, like *Topsy*, I grew to include *list* routines, and *ENDCODE* facility and so on.

Flexibility

Topsy is much more flexible than for any machine code use. It enters machine code as hex strings without separators and processes machine code to a lower type address. The standard powerful feature of the Dragon enables addresses to be copied to either decimal or hex (preceded by "H") format — as usual the circumference of the monitor.

Using *Topsy* about 12K bytes is available for machine code programs (more if you use *REM* and deleted screen instructions) on entering the program. And there are no artificial machine code bounds — it is entirely under the user's control and can be altered during the program's operation.

Topsy offers facilities to be edited (saved) if you have accidentally asked for say the load or save facility and limits entering to store to your specified reserved machine code area. This is for your safety as the Dragon hangs up if you attempt to enter to Rom. When loading and writing to areas above Rom, I obviously diagnosed something went and lost — not once, but about four times — a highly odd set of copied program amendments. This was because I put the *OSAVE* facility out at screen and hadn't saved the program prior to making it there (I have heard now).

Deleted descriptions on using the fac-

ilities are not described in this text as they can be used straight from the accompanying program listing. But a program group as this will be useful.

To avoid confusion when entering the program the letters I, O and U have not been used in variable names. Apart from the G variables and the P and R string variables, other variables have single character names (the G, P and R variables have two character names). Variables J to R are string variables, all requiring the B suffix, all others are numbers.

Understanding the G variables will assist you should you want to amend the contents of the system or individual facilities within the system. These variables are: *maxsize* (maximum lines 3270), *start* (start entry to the program) and *entry* (entry starting point in program) (action code V).

G4: Clear string value — it is set to 000 in case any bright sparks like to load a program error by entering a full buffer of test characters in one go. Inexpensive to find a suitable lower figure to match your needs. I only intend to enter an equivalent set of *ASSEMBLY* starting at any one time. If you are only interested in entering, say a maximum of 35 bytes, 150 (divisible) of hex in a single write entry, a setting of 255 is more than adequate. Having an address limit 400 bytes is safe.

G5: Highest address point a write is — set to 32707 for reasons stated above.

G6: Current highest address available for use by the Basic program (i.e. current lowest address reserved for machine code) — 0.

G8: Calculated approximate highest address +1 that the currently loaded version of *Topsy* requires for the *Topsy* program to save.

G9 — GV: Store bounds for the various facilities.

GP: The value that the string storage reservation is held to at the end of the run — set to 200.

A list of facilities follows.

Action code V: Upstart Memory Reserve Area. Entailed automatically at the start and end of a run where requires (often useful) to identify your memory of where you can

write. It gives details of the current lowest reserved for machine code address and available space (start address (line 75) 1400).

Action code W: Write Machine Code. Allows hex characters to be input as a plain character string. Requests two characters to be entered for each byte (using the most and least significant half byte respectively) but needs no byte separating characters nor other hex characters (lines 400-600).

Action code S: Save Machine Code. Its genuine shows that it is used to save your hard machine code entry efforts prior to trying to enter (real) in case of disaster. The save points the machine code entry point to be specified as either the actual address (as is required by Basic) or as an offset which may be more useful on occasion. *Topsy* then converts this to the actual address for the save (lines 600-1100).

Action code A: Allocate machine Code. Allows any machine code currently in store to be deallocated (lines 1100-1400).

Action code L: Load machine code. Allows entering machine code programs (or data saved as a machine code file) to be loaded from cassette (lines 1400-1570).

Re-saving

Action code C: Copy store to store. As machine code programs cannot be loaded at a lower address (this saved from having to find a negative offset?) this facility allows an existing (relocatable) machine code program to be loaded copied to a lower address and in saved from that lower address (lines 1400-1600).

Action Codes W, D: List/store Two useful facilities for checking file strings written moved in store — or for just browsing through memory. There is a hex listing (H) with 8 bytes to a line and a decimal listing (D) where each byte is displayed in its decimal and printable character (one octal byte per line (hex list, lines 1600-1600). Deleted list lines 1610-1710). End of run (D on main menu) OS/2-down routines (line 310-320).

Subroutines: Lines 3200 onwards are various subroutines, mostly printing of status and instructions on using features.

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Tandy's Colour Computer (Coco) - based on the 6809 family

Same chips, but a different cup of Coco

How alike are Tandy's Colour Computer and the Dragon? George Saint looks inside both to bring you the answer

A MYTH HAS developed about the Dragon's similarity to Tandy's Colour Computer. It isn't the screen or the keyboard. Is the Dragon like same as the Colour Tandy Computer? It is... Not.

This sounds qualifying, since there is a great deal of similarity between the machines, and approximately a 50 percent difference similarly to the user. Unfortunately it is the 5 percent difference that can cause all the problems to the unwary programmer — the price is concerned with highlighting the differences.

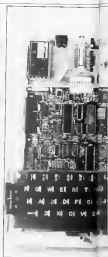
Hardware

Both the Dragon and the Coco (Colour Computer) are based on the Motorola 6809 family of chips. These are the 6809 CPU (Central Processing Unit), the MC68855 SAM (Synchronous Address Multiplexer), the MC6847 VDG (Video Display Generator), and the MC6821 PIA (Peripheral Interface Adapter). These four chips together with some basic logic a

surprisingly powerful computer needing very few other electrical components — it is with this concept that Dragon Data and Tandy have designed their machines.

The fact that the 6809 chip is compatible with the earlier 6800 source-code, and that five addressing modes are available to the programmer, makes it the most powerful 8-bit processor generally available on the market today. The speed of the CPU is about 28 MHz (Dragon Data has changed the external crystal oscillator from 14.33818 MHz in early machines to 14.318 MHz in later machines to improve picture quality). At this speed, the relative processor execution time compare very favourably with a 4 MHz Z80A-based computer system.

The 6809 chip is a half-way house to 16-bit machines, and often programs position independence (a program will execute properly when placed anywhere in the memory map) and link program redundancy to substitute can be placed by



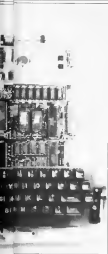
The most important difference between the

several tests concurrently without destroying the return address by nesting subroutines. This means that we can expect to see other high-level languages such as Pascal, Fortran and Cobol being run on the expanded disc-based Dragons.

Pseudo colours

You may have wondered why on a colour computer, high resolution image games are offered in black and white when a range of colours could be offered on a lower resolution with very little variation in display quality. The very best arcade games are at the moment written in Atari for the Coco, and are converted to run on the Dragon. Unfortunately, as Atari games require an advantage, set up in that they can generate pseudo colours (red, blue, green, etc.) in MODE4 by placing the available colour points very close together is generates a pseudo colour on their television sets.

The catch is that the American TV



Commodore 320 in the Dragon's 320 Ram

operates at 525 lines, and can take its signal directly from the output of the VDC chip, whereas the English PAL television operates at 625 lines, so extra circuitry is needed to convert the signal. This effectively stops any private colour television and offers to us only the television high resolution made favoured by the American politicians.

This is a great pity, since some starting efforts have been achieved with the colour standard. Both the Dragon and the Coco suffer from this problem, so is the better picture quality of the Coco due to a different colour design for the 625 line conversion? I will leave it for reader to make his own mind up on this.

The most important difference between the two machines is that the Dragon uses the 32K of Ram which he gets with the machine, as opposed to the 4K or 16K Coco. Together with the full extended Motorola Colour Basic, the Coco can be upgraded to the 32K, and the Extended

Colour Basic, but by the time this is carried out the price gap between the two machines gets even larger.

The best improvement over the Tandy machine is the provision of a parallel printer interface instead of a serial interface. This means that high speeds of printing can be carried out, and cheaper parallel printers can be used for this purpose. A serial port for the expansion slot will probably appear in the future, as those of you who want to transmit messages over the telephone line will not be so annoyed.

The connections to the expansion slot are the same for both machines, so that it is possible to run Coco cartridges (if the software is compatible).

Turning up the hardware side, the two machines are very similar, and the TPA 68 Colour Computer Technical Reference Manual will give a very close insight to the circuitry of the Dragon, although it must be kept in mind that there are changes and close similarity should be made to the amount based if hardware modifications are attempted.

Both Dragon Data and Tandy have purchased the Motorola Colour Basic in copyright. This is the only colour Basic interpreter available at the moment for other based computers, but both companies approached the two architects of the interpreter at a different way.

Tandy originally offered a non extended Basic machine, where the interpreter is stored in memory in the region 3000 to 8FFF (all addresses referred to here are in hexadecimal). As an optional (necessary?) extra, the extended Rom was offered for an additional sum of money, and this started into memory in the region 3000-8FFF. So that both Roms working together, loads were loaded into the non extended Rom which divided flow to the next page, and then to the last address Rom 4, was printed.

The first version of the Tandy Basic (1.0) suffered a bug in the printout routine, so that when a control value was processed garbage appeared on the screen. The later version of the Rom (1.1) corrected this fault. It is a disconcerted thing of the Tandy Rom is mentioned. There is no free space available in the 16K for basic routines.

Dragon Data on the other hand provides the full 16K Extended Colour Basic as standard, because the extra interpreter is supplied, the coding can be more compact than the Tandy version (although there are still the holes in the game playing), and it resides in the game bank of the memory map in the Coco Rom (3000-8FFF).

Unused space

But a disconcerted thing should be unused space from 8FFF to 8FFF1 in the Dragon Rom and the internal routines are not all the same. A prime example of this is the employed scan routine.

You may have noticed that when you are typing fast the Dragon may fail to pick up some of the letters you have typed. This will occur if a key in the same row is pressed too quickly. For example if you press the 'A' key and then any other key in

the range A-G quickly you will find the second key will be missed if you repeat the process, but press any other key outside the range A-G everything will be okay.

This problem with the keyboard scan routine on the Dragon shows up when you are working in Basic, and use the third row scan command. A good number of programs for the Coco use the combination of SHIFT/CLEAR key to return a value of 3C (30 in decimal), where the standard value is 30. If you run the following short program you will find that only by tedious repetition of both keys, simultaneously can you return this value of 3C.

```
10 30=INKEY IF 00= THEN 10
20 Y=ASC (30) PRINT Y
30 GOTO 10
```

Faster games

This problem does not occur with the Coco (because the keyboard scan routine is different, and operates more slowly. A useful spin off is that games which are converted to the Dragon operate much faster.

Programs written in Basic will sometimes work on both machines, but the following points must be kept in mind:

- 1) To load a Colour Tandy Basic program and vice versa, I think they have both saved in ASCII format (eg COLAVE, QUAVE, etc).
- 2) Do not write long lines of codes (no longer than 250 characters, a line I guess) because the ASCII save can in varying circumstances truncate the expanded line, and ends of lines will be lost.
- 3) Coco machine code routines will only really work on the Dragon, so stay clear of Coco USR calls.
- 4) When making USR calls on the Dragon you can define up to 10 USR call addresses (00 PUS 0-9) but the Dragon Rom has a bug in it and you can only access USR0. This means that X=USR0(0) will be interpreted as X=USR0(0) to get around this problem, define each call as USR0 and before making a for example:


```
10 DEFUSR00=445000 X=USR0(0)
20 DEFUSR01=445002 X=USR0(1)
```
- 5) Keep clear of combining USR call and DEFUSR. Strange errors can occur and routines which work on the Coco will not necessarily work on the Dragon.
- 6) DEFUSR(0)=LEN(USR0 CHR\$(127+1542))
- 7) A=USR0(2)

This example when used with the correct machine code routine will draw coloured border around the screen, but on the Dragon all you will get is an PC error.

Do not forget the coding of Basic programs by the removal of the basic spaces, as this can in certain circumstances generate errors. Both the Dragon and the Coco suffer from this problem, but a special user converted on the Dragon (or other implementations of Microsoft Basic) removal of blank spaces does not harm, and programs that are available to copy past the code by this method. For example TMS55 level 2 Basic. ■

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Duck Shoot

From Tony Smith in Milton Keynes

THE OBJECT OF the game is quite simple: you have to shoot the ducks swimming on the pond. However you have to do it by moving the angle of elevation of the barrel so that the bullet flies up and then falls on the unsuspecting duck.

All you have to do is fire in type in the barrel's angle of elevation. The computer does the rest by plotting the projectile's path.

As the gun used is double-barrelled, you

have two shots in each duck. The number of shots you have left and the number of ducks left are shown as data at the top of the screen. The letters are written by use of the Dragon's GOSUB command to the video message. The ducks are positioned on a random basis, and use the GET and PUT commands rather than register the duck each time.

The program makes use of the Dragon's high-resolution graphics and uses the PLAY command for a rendition of the Death March every time a duck is hit.

Program notes

Lines 190-410 Set up the picture, and input the angle from which the gun

shoots at the trajectory is drawn.

Lines 420-450 Draw the video message.

Lines 450-500 Tell you if you've shot your self or run out of ammunition.

Lines 500-510 PUT the ducks at a random position on the pond.

Lines 510-550 Deal with the end of the duck's life.

Lines 550-560 Ask the title sequence.

Lines 560-590 Print the instructions.

Lines 590-600 Print the score of ducks hit and the number of shots left.

Lines 600-6070 DRAW the score board.

Lines 6070-6070 GET the duck shape and draw the first duck.

The program takes up approximately 2K of the Dragon's memory.

```

10 REM ***** DUCK SHOOT *****
20 SCREEN 0: CLS: POKE 255,0
30 REM ***** START *****
40 GOTO 100
50 REM ***** END *****
60 REM ***** START *****
70 REM ***** END *****
80 REM ***** START *****
90 REM ***** END *****
100 REM ***** START *****
110 REM ***** END *****
120 REM ***** START *****
130 REM ***** END *****
140 REM ***** START *****
150 REM ***** END *****
160 REM ***** START *****
170 REM ***** END *****
180 REM ***** START *****
190 REM ***** END *****
200 REM ***** START *****
210 REM ***** END *****
220 REM ***** START *****
230 REM ***** END *****
240 REM ***** START *****
250 REM ***** END *****
260 REM ***** START *****
270 REM ***** END *****
280 REM ***** START *****
290 REM ***** END *****
300 REM ***** START *****
310 REM ***** END *****
320 REM ***** START *****
330 REM ***** END *****
340 REM ***** START *****
350 REM ***** END *****
360 REM ***** START *****
370 REM ***** END *****
380 REM ***** START *****
390 REM ***** END *****
400 REM ***** START *****
410 REM ***** END *****
420 REM ***** START *****
430 REM ***** END *****
440 REM ***** START *****
450 REM ***** END *****
460 REM ***** START *****
470 REM ***** END *****
480 REM ***** START *****
490 REM ***** END *****
500 REM ***** START *****
510 REM ***** END *****
520 REM ***** START *****
530 REM ***** END *****
540 REM ***** START *****
550 REM ***** END *****
560 REM ***** START *****
570 REM ***** END *****
580 REM ***** START *****
590 REM ***** END *****
600 REM ***** START *****
610 REM ***** END *****
620 REM ***** START *****
630 REM ***** END *****
640 REM ***** START *****
650 REM ***** END *****
660 REM ***** START *****
670 REM ***** END *****
680 REM ***** START *****
690 REM ***** END *****
700 REM ***** START *****
710 REM ***** END *****
720 REM ***** START *****
730 REM ***** END *****
740 REM ***** START *****
750 REM ***** END *****
760 REM ***** START *****
770 REM ***** END *****
780 REM ***** START *****
790 REM ***** END *****
800 REM ***** START *****
810 REM ***** END *****
820 REM ***** START *****
830 REM ***** END *****
840 REM ***** START *****
850 REM ***** END *****
860 REM ***** START *****
870 REM ***** END *****
880 REM ***** START *****
890 REM ***** END *****
900 REM ***** START *****
910 REM ***** END *****
920 REM ***** START *****
930 REM ***** END *****
940 REM ***** START *****
950 REM ***** END *****
960 REM ***** START *****
970 REM ***** END *****
980 REM ***** START *****
990 REM ***** END *****

```

```

1000 REM ***** START *****
1010 REM ***** END *****
1020 REM ***** START *****
1030 REM ***** END *****
1040 REM ***** START *****
1050 REM ***** END *****
1060 REM ***** START *****
1070 REM ***** END *****
1080 REM ***** START *****
1090 REM ***** END *****
1100 REM ***** START *****
1110 REM ***** END *****
1120 REM ***** START *****
1130 REM ***** END *****
1140 REM ***** START *****
1150 REM ***** END *****
1160 REM ***** START *****
1170 REM ***** END *****
1180 REM ***** START *****
1190 REM ***** END *****
1200 REM ***** START *****
1210 REM ***** END *****
1220 REM ***** START *****
1230 REM ***** END *****
1240 REM ***** START *****
1250 REM ***** END *****
1260 REM ***** START *****
1270 REM ***** END *****
1280 REM ***** START *****
1290 REM ***** END *****
1300 REM ***** START *****
1310 REM ***** END *****
1320 REM ***** START *****
1330 REM ***** END *****
1340 REM ***** START *****
1350 REM ***** END *****
1360 REM ***** START *****
1370 REM ***** END *****
1380 REM ***** START *****
1390 REM ***** END *****
1400 REM ***** START *****
1410 REM ***** END *****
1420 REM ***** START *****
1430 REM ***** END *****
1440 REM ***** START *****
1450 REM ***** END *****
1460 REM ***** START *****
1470 REM ***** END *****
1480 REM ***** START *****
1490 REM ***** END *****
1500 REM ***** START *****
1510 REM ***** END *****
1520 REM ***** START *****
1530 REM ***** END *****
1540 REM ***** START *****
1550 REM ***** END *****
1560 REM ***** START *****
1570 REM ***** END *****
1580 REM ***** START *****
1590 REM ***** END *****
1600 REM ***** START *****
1610 REM ***** END *****
1620 REM ***** START *****
1630 REM ***** END *****
1640 REM ***** START *****
1650 REM ***** END *****
1660 REM ***** START *****
1670 REM ***** END *****
1680 REM ***** START *****
1690 REM ***** END *****
1700 REM ***** START *****
1710 REM ***** END *****
1720 REM ***** START *****
1730 REM ***** END *****
1740 REM ***** START *****
1750 REM ***** END *****
1760 REM ***** START *****
1770 REM ***** END *****
1780 REM ***** START *****
1790 REM ***** END *****
1800 REM ***** START *****
1810 REM ***** END *****
1820 REM ***** START *****
1830 REM ***** END *****
1840 REM ***** START *****
1850 REM ***** END *****
1860 REM ***** START *****
1870 REM ***** END *****
1880 REM ***** START *****
1890 REM ***** END *****
1900 REM ***** START *****
1910 REM ***** END *****
1920 REM ***** START *****
1930 REM ***** END *****
1940 REM ***** START *****
1950 REM ***** END *****
1960 REM ***** START *****
1970 REM ***** END *****
1980 REM ***** START *****
1990 REM ***** END *****

```

Quilt

From J. Hildner of St. George

From J. Hildner of St. George: This PROGRAM is designed to test the Dragon 32 direct from the hex dump without having to convert the hex dump into decimal first. It can put values into any available memory space by changing the value of A.

The amount of data must equal the number of memory locations accessed. After inserting all data correctly program can be run. When OK prompt appears delete all the program. Then access machine code program as normal.

Program notes

Lines	
10	Set up memory locations. Possibly has value.
20	Splits hex into powers of 16 and 8. Returns the ASCII code.
30-40	Checks if L and R = A to F and outputs accordingly.
50	Converts to decimal.
60	Pokes memory location with decimal value.
70	Prepares for next memory location.
80	Start of data statements.

LIVE ON SETS all the colours available in the low resolution mode in a regular order on the 60 x 31 grid. As the colours build up it gradually transformed into the 16 x 30 grid. Run it for a while.

1 ROM DISKETTE ONLY
11 01.00
12 00.00
13 00.00
14 00.00

Machine code loading

```

10 FOR A = 1540 TO 1549: READ BS
20 L = ASC(LEFT$(BS,1)): R = ASC(RIGHT$(BS,1))
30 IF L = 65 OR L = 66 OR L = 67 OR L = 68 OR L = 69 OR L = 70 THEN L = L - 55 ELSE L = L - 48
40 IF R = 65 OR R = 66 OR R = 67 OR R = 68 OR R = 69 OR R = 70 THEN R = R - 55 ELSE R = R - 48
50 T = L * 16 + R
60 POKE A,T
70 NEXT
80 DATA FF EE,DD 01 BE 67,0B,
  C0,9A,3B

```

Brainbox

From Paul Hildner of St. George

BRANBOX IS THE familiar 'opti' game which has taken many forms over the centuries. You are required to guess the exact pattern of coloured colours. In fact this version for the Dragon 32 prints out five colours from eight in order and gives you 12 guesses in which to discover the hidden pattern. Any colour may be repeated as many times as the processor random number generator decides.

The colours used are the eight natural colours of the Dragon and consequently a black background is necessary.

Unlike many computers which have keys already marked with colour names, the Dragon is lacking. I have taped a small piece of card above the 1 to 5 keys on my machine carrying coloured squares as follows:

1 = green	5 = full white
2 = yellow	6 = cyan light blue
3 = blue (dark)	7 = magenta/maroon
4 = red	8 = orange

This facility can obviously then be used in other programs. It is actually an improvement on other machines which show only the colour names and not the colours.

To play the game the player presses five colour keys resulting in five coloured squares appearing in a vertical line on the screen. When all five have been selected the program responds with an assessment of the guess.

At the foot of the screen for each colour

guessed correctly in its right position a black square appears. For each other colour guessed correctly but in the wrong position a white square appears. After several guesses if the player receives five white squares for failing to hit the correct colours but that some are in the wrong positions.

After 12 unsuccessful attempts the program displays the hidden pattern. This pattern can be displayed at any time should the player wish to concede, simply by pressing the ? key. That key was used since it requires the shift key also to be depressed and is therefore unlikely to be touched accidentally.

Arrays

- G: Colour codes of the guess
- M: Colour codes of the hidden line
- H: Indicators showing which positions have been pointed for black squares at which colours are guessed in the correct positions
- W: Indicators showing which positions have been scored for white squares in which colours are correctly guessed but in a different position from that in the hidden line

Variables

- A\$: Multipurpose in setting up the screen and accepting guesses from the keyboard
- BS: Banks used for marking parts of the screen display
- C: Number of colours from which to select (eight)
- J: Loop count (one to five)
- K: Loop count (one to five)

- M: Number of attempts before the solution is revealed (one to 10)
- P: Position on screen for the next black/white assessment point
- R: Number of colours in one line guessed in their correct position
- S: Number of colours selected (five)

To reduce the difficulty of the problem the colours could be reduced to say six and the number selected to four by altering lines 530, 700 and 910 — clearly the instructions would need to be changed also if the was permanent (110 and 170).

Lines		Programmer and instructions
380		Setting up the screen
390-530		Set number of colours and selectors
540-580		Computer chooses random line
590		The 12 attempts
600-620		Reset indicators for the next guess
640		Set screen position for next assessment square
650-710		Accept colour selection checking for a correct line and marking those colours in their correct positions
715		Print the appropriate number of black squares
720-830		Count the number of colours not already marked which are correct but not in their right positions — while for each
850-940		Find position and conceding — display hidden line
950-999		Invite further games
1000 and		Delay subroutines

Program listed on page 42


```

10 ' *** BRAINBOX ***
20 ' *** BY ***
30 ' *** P. YERKLE ***
40 ' *** POOLE ***
50 ' *** (C) ***
60 ' *****
70 DIM R(10),M(10),K(10),D(4)
80 CLS 3
90 PRINT 876,"BRAINBOX"
100 PRINT @ 123,"YOU HAVE TO GUESS THE HIDDEN"
110 PRINT "PATTERN OF 5 COLOURS CHOSEN FROM 9"
120 PRINT @ 256,"YOU HAVE 12 TRIES TO GUESS THE CORRECT ARRANGEMENT"
130 PRINT @ 252,"ANY COLOUR MAY BE REPEATED ANY NUMBER OF TIMES"
140 DOSUB 1000
150 CLS 0
160 PRINT @ 32,"THE COLOURS YOU MAY CHOSE ARE "
170 FOR C=1700
180 : PRINT @ 64+C*32,CHR$(127+(6+C))
190 : PRINT @ 60+C*32,C)
200 NEXT C
210 PRINT @ 322, "THE NUMBERS REPRESENT THE KEYS"
220 PRINT "YOU MUST PRESS TO CHOOSE THAT COLOUR"
230 DOSUB 1000
240 CLS 7
250 PRINT @ 64,"AT THE FOOT OF THE SCREEN, YOU"
260 PRINT "WILL BE GIVEN AN ASSESSMENT OF"
270 PRINT "HOW GOOD IS YOUR GUESS TO THE HIDDEN LINE"
280 PRINT @ 324,CHR$(128);" MEANS A COLOUR IS IN THE RIGHT PLACE"
290 PRINT @ 328,CHR$(129);" MEANS A CORRECT COLOUR HAS"
300 PRINT " BEEN CHOSEN BUT IT IS IN THE WRONG POSITION"
310 DOSUB 1000
315 RS=""CLS 8
320 "
330 " *** SET UP THE SCREEN ***
340 "
350 FOR R=0 TO 20
360 : RS=RS+CHR$(131)
370 NEXT R
380 PRINT @ 291,RS;"
390 FOR L=0 TO 4
400 : PRINT @ L*64,CHR$(65+L)+CHR$(120)+CHR$(100);
410 : PRINT @ L*64+34,CHR$(100);
420 : PRINT @ L*64+36,CHR$(133);
430 : PRINT @ L*64+38,CHR$(120);
440 : IF L<4 THEN PRINT @ 354+L*32,;#; ELSE PRINT @ 402,LEFT$(64,20);
450 NEXT L
460 PRINT @ 290 ,CHR$(100);:PRINT @ 314,CHR$(135);
470 PRINT @ 55,"BRAIN"
470 PRINT @ 124,"BOX"
480 PRINT @ 150,LEFT$(RS,5);
490 PRINT @ 373,"PRESS"
500 PRINT @ 413,"?"
510 PRINT @ 444,"TO"
520 PRINT @ 475,"STOP"
530 C=5:S=5:DS=""
540 "
550 ' *** START ***
560 "
570 FOR R=1 TO 5
580 : R(R)=RND(C);:RS=RS+CHR$(120)
590 NEXT R
600 FOR M=1 TO 12
610 : FOR K=1 TO 5
620 : R(K)=0:MK(K)=0

```

Continued on page 44


```

630 : NEXT K
640 : P=320+R*2:R=0
650 : FOR K=1 TO 5
660 :   AB=INKEY$:IF AB="" THEN 650
670 :   IF AB="1" THEN R=12:GOTO 660
680 :   IF AB<"1" OR AB>CHR$(C) THEN 650
690 :   O(K)=ASC(AB)-48
700 :   PRINT @ K*64-32+H*2,CHR$(127+5*O(K));
710 :   IF O(K)=R*2 THEN R=R+1:R*(K)=1 ELSE R*(K)=0
720 :   IF R=5 THEN PRINT @ 347, "WELL ";PRINT @ 379, "DONE ";GOTO 760
730 : NEXT K
740 : IF R=0 THEN PRINT @ P,CHR$(126);P=P+32:R=R-1:GOTO 710
750 : FOR K=1 TO 5
760 :   IF R*(K)=1 THEN 660
770 :   FOR J=1 TO 5
780 :     IF J=K THEN 620
790 :     IF R*(J)=1 THEN 620
800 :     IF O*(K)=CHR$(C) THEN 620
810 :     IF W*(J)=1 THEN 620
820 :     W(J)=1
830 :     PRINT @ P,CHR$(126);P=P+32
840 :     J=5
850 :   NEXT J
860 : NEXT K
870 : R=0
880 : NEXT M
890 : IF AB<"1" THEN 910
900 : PRINT @ 347, "HARD ";
910 : PRINT @ 379, "LUCK ";
920 : FOR K=0 TO 2
930 :   PRINT @ P+32+411, " ";
940 : NEXT K
950 : FOR K=1 TO 3
960 :   PRINT @ 640-32,LEFT$(38,2)+CHR$(O(K)*16+127)+LEFT$(38,2);
970 :   PRINT @ 640-5,54;
980 : NEXT K
990 : PRINT @ 411,"PLAY ";
1000 : PRINT @ 443,"AGAIN";
1010 : PRINT @ 475,"Y/N ";
1020 : AB=INKEY$:IF AB="" THEN 990
1030 : IF AB="Y" THEN GOTO 910
1040 : GOTO 710:PRINT @ 224,"          THANKS FOR PLAYING" GOTO
1050 :
1060 : *** WAIT ***
1070 :
1080 : PRINT @ 450, "PRESS RESET SW TO CONTINUE";
1090 : AB=INKEY$:IF AB<" " THEN 1030
1100 : RETURN

```

Machine clock

From the Machine on Mississippi
How MANY TIMES have you glanced at your watch after staring at a flashing cursor for hours on end, only to find that you have missed your favourite TV programme? Well now you can change all that with this program for a real time. You get a permanent on screen display in hours

minutes and seconds which will even run while any Basic program is running.

The program is written completely in machine code must be entered from locations 512 to 599. The listing is given in hex to help you follow the program if you know anything about machine code. You can enter it directly into your Dragon with a hex monitor or by using the following short program.

```

50 FOR I=512 TO 599
55 PRINT I
60 INPUT POKI:P
65 NEXT I

```

You must not forget to precede each number with \$H to let the computer

know you are dealing with hex numbers. Enter the numbers carefully — any mistake will have disastrous effects.

As it stands the program will still not run as the control system does not pass through it. You must alter the zero address at 0100. Since the Basic interpreter passes through this address any attempt to change it using POKE will crash the system.

Fortunately a short machine code routine will do the job.

```

15000 CC
15001 82
15002 90
15003 FD

```

10004 01
10005 00
10006 00

Having entered this in a similar manner

to the main program type in the following
EXDD 10000 COLARFM TIME 1M
250 500 300

Your stack should appear and show run-

ning. If you load the program from tape
using CLOUDe it will run immediately on
loading without typing in any additional
commands.

010	00	020	07	030	04	040	0C	050	0E	060	F7	070	78	080	40
010	00	030	00	030	A6	040	C1	050	02	060	4F	070	78	080	00
010	1F	020	0F	030	04	040	06	050	4A	060	1F	070	7A	080	44
010	00	020	00	030	A1	040	70	050	A6	060	00	070	A0	080	00
010	00	020	07	030	A0	040	0F	050	01	060	70	070	A0	080	40
010	01	020	3C	030	06	040	0C	050	A7	060	00	070	78	080	00
010	10	020	10	030	00	040	43	050	02	060	00	070	78	080	40
010	00	020	00	030	04	040	00	050	00	060	7A	070	78	080	00
020	00	030	00	040	70	050	04	060	04	070	70	080	00	090	44
020	07	030	46	040	A7	050	10	060	07	070	70	080	0F	090	00
020	10	030	0C	040	00	050	10	060	00	070	70	080	00	090	40

Millipede

From Keith Hummelford in Astoria on Northern
Island

MILLIPEDE IS A fast graphics game in
which you eat 8 millipede and to get home
you have to cross a flowerbed, scattered
with deadly slug pellets. Left and right
arrow keys are used for movement and the

up/down is based on how many steps you
take. Your score is displayed at the end of
the game and every 100 points earned the
slug pellets become closer together.

Program notes:

Lines 10-20 Credits
40-140 Instructions
150 Sets up variables
170 Prints Millipede game inverse
310

180 Increases score
180-200 Calculates distance between
pellets
220 Checks to see if millipede
bumps into pellet
230-240 Auto repeat keyboard scan
250-260 Keep millipede on screen
280-300 Change slug pellet positions
and keep slug pellets on
screen
310-330 Score etc

MILLIPEDE

```

10  "-----
20  'BY KEITH HUMMELFORD
30  "-----
40  CLS
50  PRINT$(5); "YOU ARE A MILLIPEDE"
60  PRINT$(5); "YOU HAVE TO CROSS "
70  PRINT $(5); "THE FLOWER BED"
80  PRINT
90  PRINT "beaware of the,"
100 PRINT
110 PRINT$(10); "a)ing Pellets:xx=77xxx"
120 PRINT$(10); "<-FLOWERBED->"
130 FOR X=1 TO 100 PLAY"TI02G0FFEE" NEXT X
140 CLS
150 A=10 P=400 B=1
160 PLAY"TI05L20000C"
170 P=PRINT$+250; "a)ing"
180 B=B+1
190 D=ABS(X-10)/(0/100)
200 IF D<5 THEN D=5
210 PRINT$(CHR$(159); (PRINT$(40); CHR$(159); (PRINT$(51); " "
220 IF PEEK(1024+257+A)=159 THEN GOTO320
230 IFPEEK(343)=223 THEN A=A+1
240 IF PEEK(344)=223 THEN A=A+1
250 IF A<0 THENA=0
260 IF A>29 THEN A=29
270 P=PND(2)
280 IF P=1 THEN P=P-1 ELSE P=P+1
290 IFP<482 THENP=482
300 IF P>01510 THEN P=500
310 GOTO100
320 PRINT "YOU ATE a slug pellet"
330 PRINT "you are dead"
340 PRINT "YOU GOT "/8; " STEPS
350 PLAY"TI02015G0FFEE" GOTO140
ACROSS THE FLOWER BED"

```

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• 100% control over your business
• 100% control over your business
• 100% control over your business
• 100% control over your business

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• 100% profit loss account
• 100% net income
• 100% cash flow
• 100% control over your business
• 100% control over your business
• 100% control over your business
• 100% control over your business

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1000	1000	1000	1000
1000	1000	1000	1000
1000	1000	1000	1000
1000	1000	1000	1000
1000	1000	1000	1000
1000	1000	1000	1000

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Telephone _____

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Amiga Software	41	Logic Plus	8
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B		M	
Banley Software	25	M & J Software	50
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C		Microline	41
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Errors identified

WHILE I was attempting to convert and key in a Sharp program into my Dragon 32, I accidentally came across a new Dragon error code. This new error code, which was displayed on my screen, was 'LF error'.

When seeing this unfamiliar error code, I immediately attempted to look it up in my manual, but after discovering it was not there, I decided that you might be able to help. Can you?

Anneke Polgen
Theobald
Salford

THE 'LF' error you have encountered is the Unformatted File/line error. This occurs when you call up a file that has not been formatted. For example, if you have a file A - P02 (interim) and have not already defined the function for a DEF P02 statement you will get this error.

The error error code which is not covered in the manual is a 'CM' error, this taking is Device Number error, which will occur if you call up a device which is not listed in the example: **OPEN A - 3** will give you a CM error as no such device exists on your Dragon at present.

Dragon Club opens

I HAVE a Dragon 32 which I purchased in February this year. As part of the package provided with the computer was the guarantee. On the bottom edge of this card were the words: 'Free purchase of a Dragon 32 computer will be made a free member for 12 months of the Dragon Club'.

Since I am at the guarantee expiry time now also I am having difficulty. My question is: Is this another of those 'get your money and forget the guarantee' deals we hear about so much?

J. James
Dragon
Lancs

THIS is not another of those 'get your money and forget the guarantee' deals we hear about so much. You should have now received your first issue of the *Step Press* newsletter from Dragon Data. There were unfortunately no letters with the first issue.



Users who returned their warranty card before the date of release of *Step Press* will still have one year's free subscription, starting from the first issue of *Step Press* rather than the date of the warranty card. Users who have not yet received *Step Press* should contact Dragon Data with details and proof of purchase and they should then be put in the mailing list.

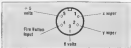
Machine coding

I WOULD like to know if there are any machine code tapes for the Dragon 32 which would be suited to an absolute beginner. I am sure many other Dragon users would like to have this information.

G. M. Page
Widley
Middlesex

THESE ARE very few tapes for machine code for absolute beginners; a good general book is *Programming the 8088* by John and Leslie, published by Sybex, priced £12.95. This should be available from good bookshops and computer dealers.

For anyone contemplating learning machine code it is advisable to have an 8088-based micro code on that platform as available by Dragon Data. It is your best protection in writing.



Front view of the socket on the Dragon

machine code. I suggest you contact your nearest computer club whose members may be able to advise you.

Joystick wiring

I HAVE heard that it is possible to use Atari and several other joysticks with the Dragon simply by changing the plug. Could you give any advice about this and if possible publish a wiring diagram for the Dragon 32 plug?

J. C. McCracken
Widley
Herts

SHOULD YOU NOT wish to use Dragon joysticks then you may connect other joysticks using a 2-pin DIN plug. The Dragon's joystick connector has 10 pins, 4 push-buttons and joysticks of a similar type should be compatible. The connections are as shown in the diagram.

Interfaces sought

I WOULD be very grateful if you could give me any information and addresses of where I could get a Dragon interface for connecting other devices using a program. For example for switching lights on and off or controlling

a robot. Also, I would like to know if unboxed manufacturers' modules for the Dragon.

G. Page
Theobald
Lancs

I AM not aware of any company that makes the type of interface you require or a module for connecting through to other devices.

It should be possible to make your own interface for controling lights via the printer port. Dragon Data is unable to supply details of the interface, obviously required but can supply the circuit diagram of the Dragon's I/O ports for reference.

Should you require a module for connecting to Pascal etc, then Moment 800 will be providing an acoustic coupler as part of its system.

Inhibiting Break key

THE BREAK key on the Dragon is placed very near the function cursor keys and cannot be controlled games often fail because the break key is touched it stops. I have tried taping the break key with TAPE 15 but it is not fast enough.

Can I FORCE somewhere to inhibit the break key?

Tony O'Brien
Woodford Green
Essex

IT IS possible to inhibit the break key with ADDRESS change but if you use an input statement such as INPUT AS that will not be inhibited. To get up the break key you should use the before key. FORK is already in the order guide.

FORK 411,226
FORK 412,303
FORK 413-4
FORK 414,207
FORK 415,229

Then to disable the break key use: **FORK 410,230** or to then enable break key use: **FORK 410,51**

Right Rainbow

THE CORRECT address for Eikon Electronics, which distributes The Rainbow, is 11 Bury Lane, Popham, Winchester SO2 6LZ. Tel: (081) 706 7813.

Competition Corner

Send your answers to Competition Corner, Dragon User, Hothouse Court, London WC2 2HP

Digging down to the roots

Gordon Lee tests your skills - Premier provides the prizes

ASK A FRIEND to write down any large number — one with, say, eight or more digits. Now tell him to mix up the same digits to form a second number, and tell him to subtract the smaller number from the larger.

For example: 72104813
14507210

57597603

Now tell him to cross out any single digit of the answer, decided for any zero, and read out to you the remaining digits. So, in

the above example, if he crossed out one of the answers he would read out: five seven, zero, seven, seven, zero, and three. You then instantly tell him the missing digit.

What's how you do it? As he reads out the digits you mentally add them up. So in this case you would add:

$5 + 7 + 0 + 7 + 0 + 3 = 25$

As this total is in fact more than ten, the digit then continues to add together the digits until only a single digit remains. So:

$2 + 5 = 7 + 1 = 1 + 3 = 2$

This is your key digit and is used out the

missing number that your friend crossed out simply subtract the key digit from 9. Amazing!

In fact, the trick relies on a very important principle in the field of mathematic puzzles — that of digital roots. The digital root — or DR — of a number is found by repeatedly adding the digits of that number until a single digit remains. Probably the most well known use of the DR is in determining if a large number is exactly divisible by either 3 or 9. Only numbers whose digital root is exactly divisible by 3 are themselves divisible by 3, and similarly only numbers whose digital root is 9 are exactly divisible by 9.

For example, take the number 1754972014 = 12578

This has a digital root of 8, so we know that this number is not a multiple of either 3 or 9. We also know that if we were to divide the number above by 8 we would have a remainder of 6, and similarly it divides by 7 it would give us a remainder of 2 ($8 \times 2 = 16$ plus 2 remainder).

Generally all perfect squares have digital roots of either 1, 4, 7 or 9, all triangular numbers have digital roots of 1, 3, 6 or 9, and perfect numbers (with the exception of 6 — the lowest are believed to have a digital root of 1). So we can say without working it out, that the above number is neither square, triangular nor perfect.

Note though that a digital root will not prove that a certain number does fall into one of these categories, only as in the cases above, that it does not.

No jokers

The principle can be transferred to, for example, I have in front of me an ordinary pack of playing cards from which I have removed the jokers, picture cards and tens. So I have left 36 cards, the ace to nine of each of the four suits — hearts, clubs, diamonds and spades. I also have twenty a number of plastic counters.

I have shuffled the cards and have dealt out four of them face upwards on to the table. These are a spade, a diamond and two hearts. I then multiply together the values of the cards (ace equals 1) and take the product obtained. This counts as one operation and so I put down one counter.

If the product so obtained consists of more than one digit, then I repeat the procedure with this number until only a single digit (or zero) remains. This is rather like finding the digital root except that here we are multiplying rather than adding the digits.

As an example, if my cards were A, 4, 4 and 9 I would write:

$1 \times 4 \times 4 \times 9 = 144 = 1 \times 4 \times 4 = 16 = 1 \times 6 = 6$

This has taken three operations, so I would also have three counters on the table.

However, with the cards that I have dealt I find that I end up with six counters. If the lowest card in the pack — what single one on the table?

Prizes

THE PRIZE THIS month is the new Delta 1 disk operating system, compiled by its developer Premier Microsystems. The package consists of a controller cartridge and 40-track, single-sided Canon disk drive, along with interconnecting cable and manual. The system provides 100K of storage.

Rules

TO WIN this disk operating system, you have to write in the short integral formula to the puzzle. You must show how the competition can be solved with the use of a Delta program developed in your

Dragon 32 computer

As a freebie, complete the following sentence in 18 words or less: I want to add a disk operating system to my Dragon in order to...

Your entry must arrive at Dragon User by the last working day of June 1983. The name of the winner, and the address to the prize, will be printed in the August issue of Dragon User. You may only enter the competition once. Entries will not be acknowledged and we cannot enter into correspondence on this issue.

Please send your entries to Competition Corner, Dragon User, Hothouse Court, London WC2 2HP.



Abstract

You are the Captain of a Galleon whose brief is to find the sunken Iron Pirates.
You can maneuver north, south, east, or west up to 4 squares at a time as you roam the ocean. Replacement of crew members, if needed, can only come from battleships.
Beware to avoid collisions with islands or Pirates, and don't fall off the edge of the world.
Take care of your stock of guns, musketeers, sails, and men in this action packed high seas adventure with an expansive High-Sea Graphics.

11/14/2011 10:34 AM

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TELEWRITER™

the DRAGON 32 Word Processor

THE JOURNAL OF THE

difficult for the press and its less politically motivated specialists, like the *Los Angeles Times* reporter, to be critically discerning about reporting on the subject of pornography. The fact that the subject is so often treated as a "hot" issue, with the tabloid focus on sex and violence, adds to the confusion and prevents a level of firm, objective analysis that is crucial to the production of more intelligent, responsible journalism. In the future, more papers, and a few links to electronic databases, should, ideally, exemplify more mature, thoughtful, and thoughtful analysis of the subject of pornography, and its effects on society.

The DRALEGE 32 can be made permanent and waterproof, so anyone that has installed it has only one thing to do. The small 12" diameter by 18" high, oval aluminum drain-outlets are, at the bottom, constructed with a thick oil-liner which is made totally waterproof. Each unit is made ready to use. The only thing to do is to place the drain-outlet in place and seal it.

FULL SCREEN EDITION

The **Telephone** since it designed for maximum ease of use. The commands are simple: **h** for **h**ome, **l** for **l**ist, **g** for **g**roups, **c** for **c**onnect, **f** for **f**ile, and **v** for **v**oice-mail. There is also **n** for **n**ext, **b** for **b**ack, **r** for **r**emove, and **d** for **d**ial. The **Telephone** is designed for maximum ease of use. The commands are simple: **h** for **h**ome, **l** for **l**ist, **g** for **g**roups, **c** for **c**onnect, **f** for **f**ile, and **v** for **v**oice-mail. There is also **n** for **n**ext, **b** for **b**ack, **r** for **r**emove, and **d** for **d**ial. The **Telephone** is designed for maximum ease of use. The commands are simple: **h** for **h**ome, **l** for **l**ist, **g** for **g**roups, **c** for **c**onnect, **f** for **f**ile, and **v** for **v**oice-mail. There is also **n** for **n**ext, **b** for **b**ack, **r** for **r**emove, and **d** for **d**ial.

1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 26

The only case with all three features:
 low price, **REASON 35**

Let's take a look at how results appear once they are in the members' email queue. I will follow the first few as well.

When $\gamma = 1$, we are, in principle, also treating narrow-sense TDMA. TDMA slots are now equally (left-right, top-bottom) sized margins, and spacing and time per page. These parameters can be set before printing or they can be dynamically modified during printing with specific forms, such as ours.

You can press all or any part of the keys before the printing is over, and start a new "Document" that will allow you to insert images on your printer. Because the printer has a small screen, you can control the image directly from the menu or during printing. It works with any printer. (Family Software, 444-45 Cinders, NYC 10024, 800-444-45 Cinders, 452).

For more, see "Cinders" (p. 1).

There's even a special driver for the Epson 800, 80 that lets you simply select any of 162 line codes for understanding with a simple understanding. (see page 1).

[illegible]

Abstract

Tektronix has more than 100 years of experience in manufacturing instruments and products for the scientific market and at the same time Tektronix has been at the forefront of the electronic instrumentation and testing markets and a world leader in computer-aided design and test equipment. A major reason for Tektronix's success is its commitment to research and development, which is a major business concern.

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